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WILLIAM OSLER, THE MEN AND INSTITUTIONS WITH WHICH HE WAS ASSOCIATED IN PHILADELPHIA*

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ALTHOUGH it seems an almost hopeless task to add anything new to the vast amount of information about Osler which has been published since his death, I felt when I was honoured by the invitation to deliver this Oration that it might possibly be of interest to his fellow-countrymen to hear something about his associations in the first city to which he migrated, and of the men who, at a comparatively early period in his career, recognizing his abilities and characteristics, secured the election of this young and comparatively little known stranger to an important chair in the oldest and one of the most conservative medical schools in the United States.

The picturesque story of Osler's election to the Chair of Clinical Medicine in the University of Pennsylvania has been fully narrated by Cushing in his wonderful biography, and I shall, therefore, only refer to it as briefly as possible. In May, 1884, Dr. Alfred Stillé (1813-1900), who had been Professor of Medicine in the University of Pennsylvania for twenty years, resigned. Stillé was a remarkable man. After graduating from Yale College he had studied medicine at the University of Pennsylvania, from which he received his M.D. in 1836. He then served as resident physician in the Philadelphia Hospital (Blockley), and in that capacity worked under William Wood Gerhard, during a period when there was an epidemic of typhus fever in Philadelphia and Gerhard's wards were filled with cases, the study of which enabled him to establish the essential difference and diagnosis of typhus from typhoid fever. At the expiration

of his term Stillé went abroad and studied under Louis in Paris. When Osler was living in Philadelphia he loved to sit with the old man and listen to his reminiscences of Louis and Gerhard. In 1902 Osler read a memorial address on Stillé before the College of Physicians of Philadelphia in which he recalled these conversations, and certainly nothing in his Philadelphia period could have been more congenial to him than his intimate contact with this survivor of the Paris group which he admired so greatly. Stillé's predecessor in the Chair of Medicine at the University of Pennsylvania had been William Pepper (1810-1864), and the latter's son, William Pepper, Jr., who had held the Chair of Clinical Medicine for a number of years, was destined to succeed Stillé, thus leaving a vacancy in the Clinical Chair, for which there were three prominent candidates, Edward T. Bruen, Assistant Professor of Physical Diagnosis; Louis Starr, Clinical Professor of Diseases of Children, and Juan Guiteras, a Cuban by birth, who after graduating from the Medical Department of the University had won a deserved reputation as an expert on tropical diseases, and who later, in 1889, became Professor of Pathology in the University. Bruen had taught physical diagnosis for years and, though not a brilliant man, was a good conscientious teacher. Starr was a widely known authority on the diseases of children, with a very large practice, and was most popular socially and with his professional colleagues. To some influential men, however, none of the three seemed suitable for the position. Cushing got from Dr. Minis Hays the story how at a weekly meeting of the Editorial Staff of the *Medical News*, then an influential weekly medical journal, the matter was discussed. It was stated that

*The Second Osler oration delivered at the Sixty-third Annual Meeting of the Canadian Medical Association, Toronto, June 22nd, 1932.

the Medical Committee of the Trustees had already recommended Dr. Bruen for the position and those present felt that this nomination was a mistake. None of them except Tyson had ever met Osler, but someone suggested his name as an eligible candidate. Dr. James Tyson, then Professor of Pathology and Dean of the Medical School at the University of Pennsylvania, and the only man on its Faculty who was present, said he thought it was too late to do anything, but that he would speak to Dr. Horatio C. Wood, the Professor of Therapeutics and a man of great influence in the University circles. Wood took up the idea, and with characteristic energy dashed off to Montreal to make inquiries concerning the suggested candidate. Osler was abroad at the time so that it was impossible to see him personally, but Wood heard such enthusiastic expressions on all sides concerning Osler's personality and professional qualifications that he came back to Philadelphia determined to do everything in his power to secure his election to the clinical Chair of Medicine. It is curious that Osler later stated that the men primarily responsible for his coming to Philadelphia were Samuel W. Gross and Minis Hays, neither of whom was affiliated in any way with the University. Samuel W. Gross was Professor of Surgery in the Jefferson Medical College, and Minis Hays (1847-1925), though he graduated from the Medical Department of the University in 1865, never had any further active connection with the institution.

Tyson was deputed to write to Osler and ask him to be a candidate, and Weir Mitchell, who was in London, was asked to get in communication with Osler. Tyson's letter reached Osler in Leipzig and he met Mitchell in London. You all know Osler's story of Mitchell's method of testing his gentility, giving him cherry pie and seeing how he got rid of the cherry stones. Fortunately Osler responded properly to the test by disposing of them in a spoon. Whether it was the result of the test or not, S. Weir Mitchell was for Osler from the time he knew that he was being considered, forwarding letters in Osler's favour from Burdon-Sanderson and other Englishmen, writing himself to everyone who could help, and using all his great influence. Mitchell was a great power in the medical profession in Philadelphia, and also socially, although, curiously enough, he had tried and failed to get a professorship in both the University and Jefferson Medical College. However, in 1875,

he had been elected a Trustee of the University and ever since had been very active in its management.

The first public mention of Osler's appointment was made in the *Medical News*, of Philadelphia, August 9, 1884. It stated: "Dr. William Osler, of McGill University, is prominently and favourably mentioned in connection with the Professorship of Clinical Medicine in the University of Pennsylvania, rendered vacant by the transfer of Dr. Pepper to the Chair of Theory and Practice of Medicine. Dr. Osler is widely known as a talented scholar, a learned clinician and a popular teacher, and his election, which it is understood will be very acceptable to the Medical Faculty, would add undoubtedly to the high reputation which the University has already enjoyed."

In the same month, August, 1884, the Canadian Medical Association was meeting in Toronto and it became generally known that Osler had accepted the appointment of Clinical Professor of Medicine in the University of Pennsylvania, in spite of which at the same meeting he was elected its President, an honour which he must have appreciated all the more, coming at such a time. His formal election to the chair occurred on October 7, 1884.

Osler was familiar with the history of medicine in Philadelphia from its earliest days and could talk of the early physicians as though he were personally acquainted with them. Cushing tells the story of Osler sending Hewetson, a McGill man, who could not be expected to know about these figures of the past in a strange city, over to Philadelphia to look up something in the College of Physicians, saying to him in an offhand way as he was leaving, "Do drop in on my old friends Philip Syng Physick and Shippen, and give them my love." Hewetson spent most of the afternoon looking these gentlemen up, needless to say, fruitlessly. It must have been gratifying to a young man of thirty-five to have a professorship offered him in the oldest and one of the leading medical schools of the United States, have his acceptance solicited by men like S. Weir Mitchell and H. C. Wood, and not have to make any canvass for the position. I believe, too, that with his unusual knowledge of medical conditions in every medical centre he knew that in Philadelphia he would have great facilities for research, clinical work, and teaching. Just as he left Philadelphia for Baltimore five years later because the latter offered greater opportunities

for the work he wanted to do, so I think he left Montreal for Philadelphia because at that time it had more to offer him.

Osler arrived to take up his work in Philadelphia on October 11, 1884. For some time he stayed at the Aldine Hotel, which has now been torn down, but then stood on Chestnut Street above 19th Street, but on October 31st he moved into lodgings in a house at 131 South 15th Street, now replaced by the Union League Club. Although not known personally to many Philadelphians, he had visited the city before. Dr. George E. de Schweinitz recalls that he had passed some days on a previous occasion in 1881 or 1882 investigating the incidence of parasitic diseases in patients in the wards of the hospitals in Philadelphia. It certainly was not long before the Philadelphians took him to their hearts and during his five years in the "City of Brotherly Love" he was welcomed and loved in hundreds of households. Dr. James C. Wilson recalls his first meeting with Osler. Madame Seiler, a remarkably gifted woman, a singing teacher who had been one of the first to procure a laryngoscope after Czermak had perfected it, and had written an excellent book on voice production, gave a musicale at her house on October 31st which was attended by Osler and Wilson. Dr. Wilson was then living on 15th Street below Walnut, only a few doors from Osler's apartments into which he had moved that day. They walked home together and Dr. Wilson lost his heart at once to the newcomer, who soon became a frequent visitor to the Wilson house and was known as "Uncle Osler" to the young Wilsons. Cushing gives a number of notes jotted down in an account book which show that during the first few weeks after his arrival he had dined out with various newfound friends almost every night.

From the very first Osler's social contacts in Philadelphia were many and delightful, the above-mentioned notes indicating invitations to dinner with many of the leading physicians of Philadelphia: Gross, Brinton, Mitchell, Pepper and Wood. His first Thanksgiving Day dinner, a great festival in the States, he ate at Tyson's. At the homes of all these men he became a frequent and welcome guest. It might be noticed that they represent both the University of Pennsylvania and Jefferson Medical College.

HIS PROFESSIONAL ASSOCIATES AND FRIENDS

S. Weir Mitchell (1829-1914) was one of the most outstanding figures of his day in Philadelphia. The social prominence and affluence of his family had really been less of a factor in his success than the ability and energy which were peculiar to himself. He had made his scientific reputation by his researches on snake venom, and by some remarkable studies on gunshot wounds and injuries of the nerves. During the Civil War he, with Drs. George R. Morehouse and W. W. Keen, had been placed in charge of some special wards devoted to the treatment of nerve disorders in an army hospital in Philadelphia. The monograph which they published* as a result of their service was an original and remarkable contribution to the subject and won its authors well deserved reputation. In the "seventies" Mitchell originated his famous "rest cure," thereby acquiring national fame and an enormous practice. A great reader and student of literature, Mitchell wrote many novels and quite a number of poems, some of real merit. Hospitable and kindly, he had hosts of friends and his house was one of the pleasantest social centres of Philadelphia. He was elected President of the College of Physicians in 1886-87-88, and again in 1892-93-94. He was one of that institution's most generous benefactors and it was through his influence that Mr. Andrew Carnegie gave the College the large sum of money which enabled them to build its present home in 1909. His memory is perpetuated by a triennial oration and by the largest hall in the College, which is called after him.

James Tyson (1841-1919), in 1884, was Professor of Pathology and Dean of the Faculty in the Medical Department of the University of Pennsylvania, and in 1887, when Osler went to Baltimore, Tyson succeeded him as Professor of Clinical Medicine. Though not a brilliant lecturer, Tyson was an excellent teacher, popular with his colleagues, and greatly beloved by the students. Later in his career he was elected to the presidency of the Association of American Physicians and from 1907 to 1910 he was President of the College of Physicians of Philadelphia.

In 1884 Horatio C. Wood (1841-1920) was Professor of Therapeutics and also of Nervous Diseases in the University of Pennsylvania, and had written textbooks on both these subjects.

*Gunshot wounds and other Injuries of the Nerves Philadelphia, 1864.

Like Osler in his earlier years he had taken a great interest in natural history, having published in 1865 a handbook on "The Myriapoda of the United States," and in 1872 a memoir on "The Fresh Water Algæ of North America." For some years he was Professor of Botany in the Auxiliary Faculty of Medicine in the University of Pennsylvania.

Wood was a very religious man, of very strong character, with an acute and vigorous mind. Though most kindhearted he was at times very brusque. His lectures, couched in forceful language, and delivered with much oratorical skill, were very much to the liking of the students. He was President of the College of Physicians of Philadelphia in 1902-03. He was a nephew of Dr. George B. Wood (1797-1879), former Professor of the Theory and Practice of Medicine in the University of Pennsylvania, and President of the College of Physicians of Philadelphia. To both of these institutions Wood had been a most generous benefactor. The Woods figure together in the *Bibliotheca Literaria* of the *Bibliotheca Osleriana*. In 1917 Horatio Wood sent Osler a copy of a poem written by his uncle. It was entitled "First and Last, a Poem Intended to Illustrate the Ways of God to Man." Horatio Wood wrote to Osler that his uncle had had the book secretly printed in London, and put on the market by an American publisher to see if it would sell, but that, "the public would have none of it. So the edition was destroyed, except for a few copies; as Dr. Wood's pride would not allow his successful career to be smirched by a taint of failure." George B. Wood may have been a failure as a poet but he wrote a textbook of medicine which was highly esteemed, and he was the founder and for many years editor of the *United States Dispensatory*.

In 1898 Osler* wrote a memoir of William Pepper which is one of the truest and fairest estimates of the character and achievements of that many-sided man of genius.

William Pepper (1843-1898), whom Osler succeeded in the Chair of Clinical Medicine, was the son of another William Pepper (1810-1864), who had been one of the most distinguished physicians of his time in Philadelphia. The elder Pepper had been a student of Louis in Paris, and on his return to Philadelphia had acquired a large practice, and in 1860 succeeded Dr. George B. Wood as Professor of the Theory

and Practice of Medicine at the University of Pennsylvania, the chair to which his son was elected in 1884. William Pepper, Jr., was a most remarkable man. In his earlier years he was deeply interested in morbid anatomy and pathology. He graduated from the Medical Department of the University of Pennsylvania in 1864, and, after serving a term as resident physician in the Pennsylvania Hospital, was appointed pathologist to the Hospital and curator of the pathological museum. In this capacity, in collaboration with Dr. Thomas G. Morton, he published in 1869 a descriptive catalogue of the Museum. In 1868 he was appointed Lecturer on Morbid Anatomy at the University of Pennsylvania. Osler says "Making autopsies, working in that Museum, studying tumours and microscopic specimens, his time could not have been more fortunately spent. . . . Throughout his entire career this work lent accuracy and firmness to his diagnosis. Quite early in my association with him I saw that he had served an apprenticeship in the deadhouse." In 1870 he was associated with Dr. John Forsythe Meigs in the publication of the fourth edition of the latter's well known work on Diseases of Children. To this publication Osler gives unstinted praise, pointing to the great improvement that this edition was over the preceding one, and awarding Pepper the credit for most of the new work. Osler states his belief that nowhere in literature before 1870 is the importance of the appendix so fully recognized, or is there so good a description of the results of perforation. In 1873 when the University Hospital was opened Dr. Pepper was elected Clinical Professor of Medicine, which position he held until his election to the chair of practice in 1884. Three years before, in 1881, Pepper had been appointed Provost of the University, and in consequence an enormous amount of administrative work had been thrown upon his shoulders. Pepper was an admirable lecturer and clinician. Of striking appearance, with a good figure, and always well-turned out in a frock coat, his elegant diction and dramatic delivery made his didactic lectures most interesting and his clinical lectures unsurpassed. There is a story that once in his clinic he lectured on a case of chronic catarrhal jaundice as one of Addison's disease. His former assistant and later successor, Dr. Alfred Stengel* has related

*An Alabama Student and other Biographical says, 1909.

*The General Magazine and Historical Chronicle of the University of Pennsylvania, April, 1926, Vol. XXVIII, No. 3.

the true story of this episode. Pepper told him that a physician had promised he would send a patient with Addison's disease to the hospital for him to show in his clinic. Dr. Pepper sent Stengel out before the hour of the clinic, telling him to get the man's history and examine his blood. When Stengel found the patient with yellow sclera and that the bronzing of his skin was due to jaundice he tried to intercept Pepper when he arrived at the hospital, but failed to catch him before he had entered the amphitheatre; "Facing the students and with his back to the patient whom he had not seen and the doctors in the arena, he began: 'One of the interesting diseases which we sometimes meet with but have only rarely the opportunity of presenting in clinic, is Addison's disease; it gives me pleasure, therefore, to present this case'—and turning at this point, glancing a mere second at the patient, he continued his sentence,—'which introduces important considerations concerning the differential diagnosis.' " This was followed "by a delightful presentation of the subject of chronic jaundice, its superficial resemblance to Addison's disease, the nature of the latter, the cause and type of the pigmentation, etc., etc." This may be regarded as a typical illustration of Dr. Pepper's keenness, quickness of perception, and self-possession. Dr. Pepper was an ardent advocate of higher standards in medical education. Although it is sometimes intimated that he neglected laboratory and research work, it should be recalled that he founded the Pepper Clinical Laboratory of the University, and I have already mentioned his early labours in pathology and cited Osler's opinion as to their influence on his subsequent work.

The amount of work accomplished by Pepper outside of his University duties was truly astonishing. He founded an Archeological Museum in connection with the University, created the Free Library system for Philadelphia, and established the Philadelphia Commercial Museum. The latter was the direct outcome of his desire that the United States should be brought in closer relations with the countries of South America, and this also led to the creation of the Pan-American Medical Congress.

Samuel W. Gross (1837-1889), the son of the famous surgeon Samuel D. Gross, had inherited much of his father's brilliancy and dexterity. When the latter resigned the professorship of surgery in Jefferson Medical College in 1882, the chair was divided between the younger Gross

and John H. Brinton. In 1878 Gross married Miss Grace Linzee Revere, of Boston, who after his death became the wife of William Osler. The older Gross died May 6, 1884, some months before Osler came to Philadelphia. Cushing tells how the Dr. and Mrs. Gross were among the earliest callers on Osler and that he fell into the habit of dining with them almost every Sunday. The couple were renowned for their kindness and hospitality, and we all know how, as Mrs. Osler, the lady of the house continued to maintain the same lavish hospitality. During his sojourn in Philadelphia there were few houses more frequented by Osler than the big house at 1112 Walnut Street which was the home of the Grosses. Osler was out of the city when Gross was stricken with a fatal pneumonia. He was attended by Drs. DaCosta, Horwitz and Wirgman, and Osler returned in time to join with them during the last days. Gross died on April 16, 1889. Three years later, on May 6, 1892, Osler married his widow and took her off to Baltimore, and some months later they were installed at No. 1, West Franklin Street, which Osler, according to Cushing, bought "because it reminded him of 1112 Walnut Street, Phila."

SOCIAL CONTACTS

For sometime after his arrival Osler was in the habit of dining at the Colonnade Hotel, which then stood at Chestnut and 15th Streets, but it was not many months before he was elected a member of the Rittenhouse Club, and henceforth that was his usual dining place on his few free evenings.

In Philadelphia there have always been a number of small dining clubs, and Weir Mitchell had early noted the peculiar fitness of Osler for membership in one such organization, the Biological Club, which used to meet and dine in rotation at the members' houses. He was duly elected and enjoyed his association with it very much. The membership was composed of a number of distinguished laymen, including railroad presidents, bankers, and civil engineers, as well as many prominent physicians. One of the most loved of its members was Joseph Leidy (1823-1891), Professor of Anatomy in the Medical Department of the University of Pennsylvania, the leading American anatomist and biologist of his time, and a pioneer in parasitology. In 1846 he had discovered the *Trichina spiralis* in hogs, and in 1886 he found the hookworm in the cat, and suggested that it might possibly be the cause

of pernicious anæmia in human beings. His ardour in the search for parasites lends point to the following story. In the good old days in Philadelphia terrapin was a favourite dish and there is a story that once at a dinner of the "Biological Club", which was greatly devoted to the "Worship of the Sacred Tortoise" Franklin Gowen, President of the Reading Railroad, asked Leidy how he had found the dozen terrapin he had sent him a month ago. Leidy replied, "Magnificent, Gowen! I dissected the entire twelve and discovered in the twelve intestines three parasites previously unknown!" "My God!" exploded Gowen, "Is that what you did with the dozen?" "Gowen," said Weir Mitchell, "never give Leidy anything that is edible and worth dissecting. We all know where it will go."* The Biological Club ceased to exist in the early "nineties." Cushing quotes a letter from Osler to James C. Wilson in which he writes, "We need men like Joseph Leidy and the late John C. Dalton, who, with us and yet not of us, can look at problems apart from practice and pecuniary considerations."

Shortly after his arrival Osler was also elected to the "Medical Club," which had been started by Dr. George Pepper in 1867. Each month during the winter the members in rotation give a dinner to the Club. As H. C. Wood, James Tyson and William Pepper were members of the Club in 1884 it is not difficult to see why Osler was elected to the vacancy caused by the death of Dr. Charles T. Hunter in April, 1884. Among the other members Wharton Sinkler (1845-1910), with whom Osler was closely associated at the Orthopedic Hospital, and Frederick P. Henry (1844-1919), the Honorary Librarian of the College of Physicians of Philadelphia, were soon to be numbered among his warmest friends. Although the club continues to flourish, we now number but one man, Dr. James C. Wilson, who was a member when Dr. Osler was in Philadelphia.

Another dining club which Osler joined was the "Mahogany Tree", composed chiefly of literary men with a sprinkling of physicians. Weir Mitchell was one of its most active members, and he promptly secured Osler as a valued addition. This club no longer exists.

MEDICAL INSTITUTIONS IN WHICH OSLER WAS INTERESTED

When the College of Physicians of Philadelphia

*Weir Mitchell, *His Life and Letters*, by Anna Robeson Burr, Philadelphia, 1929.

was founded in 1787, of the eleven Senior Fellows four had graduated in medicine at Edinburgh, and four others had studied there, but for various reasons had not acquired the degree of M.D. At the Centennial Celebration of the College, Dr. Weir Mitchell said, "Genealogically we might speak of our College and of the University as children of Edinburgh and grandchildren of Leyden."

Osler was elected a Fellow of the College of Physicians in January, 1885, and one year later, January, 1886, at the Annual Meeting he was elected a member of the Library Committee. The election to this important committee of one who had only been a Fellow for one year was most unusual and shows how great an impression Osler's rare qualifications had made on his colleagues. At the same meeting Weir Mitchell was elected President of the College, necessitating his resignation from the Library Committee, of which he had been a member and it was to fill the vacancy caused by his withdrawal that the College elected so appropriate a successor. Osler was re-elected to the Library Committee at each Annual Meeting of the College until his removal to Baltimore.

The Librarian of the College of Physicians, Mr. Charles Perry Fisher, had been appointed to that position in 1882, and has remained in charge of the Library until the present time (1932). During this long period, largely through his devotion and ability, the Library has become one of the great medical libraries of the world. What the advent of Osler meant to him it would be hard to express. Mr. Fisher was especially interested in adding to the Library's collection of medical incunabula and filling up its special collections, such as Harveiana, editions of the *Regimen Sanitatis Salernitanum*, and filling out wherever possible collections of all the writings and editions of them of the great medical authorities; in other words he wished to form what Osler would term a *bibliotheca prima* of the first importance. Nothing could have made a greater appeal to Osler, and in subsequent years, even after he left Philadelphia, his cooperation did much to accomplish Mr. Fisher's plan. E. B. Krumbhaar* lists fifty-four titles of books presented by Osler to the College of Physicians, and this does not include the many which were

*Osler's Connection with the Library of the College of Physicians of Philadelphia. *Bulletin No. IX, of the International Association of Medical Museums*. Edited by Maude E. Abbott, M.D., Montreal, 1927.

bought by securing the necessary money through contributions made by groups of Fellows, Osler being among the most generous subscribers on these occasions. W. W. Keen tells a typical story apropos of this. After Osler had gone to Oxford he wrote to S. Weir Mitchell that Quaritch had a beautiful edition of the 1478 Celsus which the College ought to have. He wrote "I'll give \$25. Can't you bleed the Fellows for the rest." Mitchell did and the book is now in our Library.

In the archives of the Library there are preserved nearly one hundred notes written by Osler to Mr. Fisher on matters pertaining to it. In most of them he asks if the Library has some rare or important book which he has come across. If the answer was in the negative the book would be sent as a gift. Once he sent a scrapbook with a collection of broadsides and pamphlets concerning the Siamese twins, which he thought the College should have because they were autopsied by one of our Fellows and the Mütter Museum of our College contains much of pathological interest concerning them. Another time he sent a pamphlet by Joseph Priestley, because Priestley came out to America, was offered the Chair of Chemistry in the University of Pennsylvania, and died in Carlisle, Pa.

The College possesses an original crayon portrait of Osler, made in 1914 by John Singer Sargent, the American artist who passed most of his life in London, and who painted the superb group of the four Johns Hopkins professors, Osler, Halsted, Welch and Kelly. Osler termed it a "splendid crayon sketch."

In January, 1887, the College held a celebration in honour of its Centennial. Osler was too recently elected a Fellow to take a prominent part on this occasion, but we cannot help feeling that he had something to do with bringing about the conferring of the Associate Fellowship on Robert Palmer Howard, who was present at the celebration.

As we all know, when on his deathbed, Sir William wrote on little slips of paper short notes bequeathing books or other articles which he wished given to certain institutions after his death. On one of these slips he wrote that his manuscript copy of the *Lilium Medicinæ* of Bernard of Gordon should go to the College of Physicians of Philadelphia.

Besides the College of Physicians the Philadelphia Pathological Society absorbed much of

Osler's interest. Landis* found a record in the Minutes of the Society on December 11, 1884, that "Dr. Osler being present he was invited to take part in the discussions." Elected a member on March 12, 1885, he made his first presentation on April 9th. During his residence in Philadelphia he appeared before the Society fifty-two times, and was a constant attendant at its meetings and participant in its proceedings.

Although he never became officially connected with the Pennsylvania Hospital Osler was frequently there, and he was familiar with and fond of talking about its history, and the lives of the men who had built up its fame, Morgan, Shippen, Rush, Physick, Wistar, and, especially, William W. Gerhard. Osler wrote that, "for more than a century the Pennsylvania Hospital has been the nursing mother—the *pia mater*—of the kings of the clinic in Philadelphia."

In another famous Philadelphia institution, the Philadelphia Almshouse and Hospital, more generally known as "Blockley" from the district in which it is situated, and now officially designated the Philadelphia General Hospital†. Osler while in Philadelphia did an immense amount of work. This enormous institution was the city hospital and furnished magnificent clinical and pathological material. A little over a year after his arrival in Philadelphia, the Board of Guardians of the Poor, elected Osler, December 28, 1885, as one of the physicians to the Philadelphia General Hospital. In a letter written many years later to Dr. John Welsh Croskey, Osler said that he owed his appointment to Blockley to William Pepper. Although there were two regular pathologists on the staff of the Hospital, Osler used to perform most of his autopsies himself, a custom which led to a protest on the part of the pathologists to the Hospital and the passage of a rule that no physician to the Hospital could autopsy any case except from his own ward, and then only in the presence of the Chief Resident Physician. According to

*Pathological Records of Blockley Hospital, *Bulletin No. IX of the International Association of Medical Museums*. Edited by Maude E. Abbott, M.D., Montreal, 1927.

†Cushing in his "Life of Sir William Osler," speaks of Blockley as "the oldest hospital in the States," a claim which was loosely made for many years but is not literally true. In 1731 Philadelphia established a poor house, or "bettering house" which after several changes of location was finally built on its present site. No provision was made to take in sick or injured persons, and even the paupers when ill were transferred in the latter half of the eighteenth century to the Pennsylvania Hospital. It was not until the nineteenth century that the word "hospital" was added to its title.

Dr. H. R. M. Landis* during his service at Blockley Osler performed personally 162 autopsies. "Of this number he had been the attending physician in 94 while the remaining 68 belonged to his colleagues." The records of the 162 autopsies, as Cushing says, are all written "in his own unmistakable chirography."

In 1885 Osler was appointed attending physician to the Orthopedic Hospital and Infirmary for Nervous Diseases, and became deeply interested in its work. The other attending physicians to the Orthopedic Hospital were S. Weir Mitchell and Wharton Sinkler, his warm friends. Dr. William J. Taylor, who was then one of the assistant surgeons and is now attending surgeon, recalls the interest with which Osler followed up the surgical aspects of the neurological cases in which he was interested. Osler's interest was especially excited in the great number of cases of chorea which came to the Hospital and he wrote several papers based on his studies of them. Dr. George E. de Schweinitz recalls that at that time attention had been directed to the occurrence of ocular defects in relation to chorea. Osler suggested that he make a study of the eyes of the chorea cases at the Orthopedic Hospital, which he did, publishing his results in the *New York Medical Journal*, June 13, 1888. In this connection Dr. de Schweinitz states that to him Osler's most distinguishing trait was his astonishing powers of observation, enabling him to take in the most minute details of a person's appearance and characteristics at a glance. Both de Schweinitz and Taylor also recall the deftness and thoroughness with which Osler would perform an autopsy, dissecting an organ with the skill and dexterity of a surgeon performing an operation.

Four years had passed since Osler had arrived in Philadelphia, when it became known in October, 1888, that he had accepted the position of Physician-in-Chief to Johns Hopkins Hospital and would leave Philadelphia for Baltimore in the following spring. To the majority the news came as a great surprise. Only a month before Osler had moved into a house he had rented at Walnut and Fifteenth Streets, and he had become so much a part of the social and professional life

of Philadelphia that the thought of his departure came as a shock. Osler's definite announcement of his acceptance of the position at Johns Hopkins was sent to Pepper in the following letter* dated October 3, 1888: "I have received a definite offer from the J. H. authorities & have determined to accept it, I shall leave you with deep regret. You have been like a good, kind brother. There need be no hurry about any official action, & I only write this so that you may be the first to know of it."

Gross is said to have remarked to Pepper when spoken to about it, "What have we got in Philadelphia to compete with it." Osler left Philadelphia, as he had left Montreal, because he was offered better opportunities to carry on the work to which his life was devoted. On May 1, 1889, he delivered the Valedictory Address at the University of Pennsylvania,† in the course of which he said: "One might have thought that in the premier school of America, in this *Civitas Hippocratica*, with associations so dear to a lover of his profession, with colleagues so distinguished, and with students so considerate, one might have thought, I say, that the Hercules Pillars of man's ambition had here been reached. . . . A stranger—I cannot say, an alien—among you, I have been made to feel at home—more you could not have done. Could I say more? Whatever the future may have in store of success or of trials, nothing can blot the memory of the happy days I have spent in this city, and nothing can quench the pride I shall always feel at having been associated, even for a time, with a Faculty so notable in the past, so distinguished in the present, as that from which I now part."

Thus Osler left Philadelphia, but, as with Montreal, he ever retained his interest in its affairs, and frequently revisited his old associates and haunts, and was a welcome guest at the homes of his old friends. I have spoken before of his continued interest in the College of Physicians. In 1903 at a dinner of the College the President, S. Weir Mitchell, had announced a gift of \$50,000 towards a new building fund, conditioned on the Fellows raising an equal amount. Osler was to have been present at the dinner, but was unable to attend. However, he sent a telegram of congratulation, adding "Put Mrs. Osler and me down for \$500." In 1902 he read a memorial address on Alfred Stillé before the College, in

*The most complete and accurate record of Osler's pathological work in Philadelphia is contained in "The Pathological Records of the Blockley Hospital," by H. R. M. Landis, published in the *Bulletin, No. IX, of the International Association of Medical Museums, Osler Memorial Number*, edited by Maude E. Abbott, M.D.

*Cushing's Life of Osler, 1, 298.

†Aequanimitas. Valedictory Address, University of Pennsylvania, May 1, 1889.

which he touchingly referred to his contact with that survivor of Louis' pupils during his residence in Philadelphia. His presence in consultations was frequently sought by his former Philadelphia colleagues and pupils, and from Philadelphia he took his wife, the widow of Samuel W. Gross, in 1892.

I do not know how I can better close my consideration of Sir William Osler's five years' sojourn in Philadelphia than by a quotation from a poem which his friend, Dr. S. Weir Mitchell, addressed to him and read at a meeting of the

Charaka Club in New York in March, 1905* It was entitled "Books and the Man," and in it Mitchell refers with deep feeling to his first meeting with Osler and to the latter's years in Philadelphia. He wrote:

"Do you perchance recall when first we met—
And gaily winged with thought the flying night
And won with ease the friendship of the mind,—
I like to call it friendship at first sight.
"And then you found with us a second home,
And, in the practice of life's happiest art
You little guessed how readily you won
The added friendship of the open heart."

*Proceedings of the Charaka Club, Vol. II, 1906.

THOROTRAST*

A NEW CONTRAST MEDIUM FOR RADIOLOGICAL DIAGNOSIS

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AS the method of examination by the roentgen ray has developed new weapons from time to time have been added to our armament, to aid us in obtaining greater knowledge of the various pathological lesions recorded on our fluoroscopic screen and photographic films. Barium sulphate was a far reaching advance over the older bismuth with its soluble salts; solutions of iodine used in retrograde pyelography were followed by Skiodan and Uroselectan, adding greatly to our knowledge of and ability to demonstrate lesions of the genito-urinary tract. The Graham-Cole method, devised to demonstrate function of the gall-bladder, opened up a new field, until to-day by use of the various preparations on the market gall-bladder disease is easily recorded and diagnosed. There still remained a large part of the human anatomy which was a closed book to us, or if we did by chance obtain any evidence of disease it was by the indirect method rather than by direct demonstration of the lesion in the viscus or viscera involved. We believe the time is fast approaching when we shall demonstrate lesions involving the liver, spleen, lymph glands, brain, arterial system, genito-urinary system, and to some extent the suprarenals, ovaries, bone marrow, and malposition of the placenta, as

easily as we carry out a routine gastro-intestinal examination to-day.

In the latter part of 1930 Paul Radt¹ discussed his method of the administration of thorium in a colloid solution of high dispersion and low or no toxicity, for the study of disease of the liver and spleen by the radiological method. From the early part of 1931, and still continuing, considerable research has been undertaken abroad with the new medium. In September, 1931, the Heyden Chemical Company requested us to carry out experimental work here, and very kindly placed at our disposal an unlimited supply of the solutions known as "Thorotrast" and "Umbrathor," at the same time forwarding us translations of the articles appearing in the continental journals shortly after their publication. We were immediately attracted by the possibility of solving problems by this method of examination, and enthusiastically accepted the offer.

In order that the investigations should be carried on from all angles we asked the co-operation of other departments. Professors W. E. Gallie and F. G. Banting assigned Drs. Ian Macdonald and D. A. Irwin^{2,3} to the clinical and medical research of this subject. These two workers have, during the winter, carried on a vast amount of research on the method of absorption, deposit, elimination, toxic reaction, radio-activity, and pathological changes

* Read in the Section of Radiology of the Canadian Medical Association, at the Sixty-third Annual Meeting, Toronto, June 23, 1932.

in the viscus showing the greatest retention of the thorium, and any change in the blood picture which might point to an untoward result. We are very thankful to them for their work, and any quotations we may make from the clinical or animal research findings are given with full and grateful acknowledgment to them. Their articles appear in this issue of our *Journal*, and will give much added information from the histological, clinical, and pathological aspects.

Radt prepared a colloidal solution of 25 per cent thorium dioxide of high dispersion and low toxicity. This was injected intravenously, the solution having been previously heated to body temperature. The dosage will vary with the particular viscus to be studied, whether it be desired to obtain simply an outline of the liver or spleen, or whether a complete impregnation of these organs is desired. Doses of 10 to 20 c.c. will give simply structural outline, while doses of 75 to 80 c.c. will produce an appearance in the normal spleen and liver as if they were carved from limestone. It is possible to give 5 c.c. per kilo of body weight in rabbits without any ill effects, and, as we have obtained a solid white shadow of the liver and spleen in the human being with 0.8 per kilo of body weight, it will be understood that we are well below any danger line.

Thorotrast, or rather the thorium dioxide content, possesses the property of depositing itself throughout the cells of the reticulo-endothelial system. The liver, spleen, bone marrow and lymphatic glands, all receive relatively the same amount per gram of volume; smaller amounts are found in the adrenals and ovary; none has been demonstrated in the testicles. Occasionally, the kidney will show a slight deposit of the thorium dioxide in the intracellular spaces, but only if pre-existing disease is present, a normal kidney showing no retention. The lungs sectioned within a few days after administration of the thorium dioxide show a very sparse distribution of deposit, if no previously existing disease condition has obtained. This is simply an engulfing reaction. If a lesion is present the deposit is similar to that found in the diseased kidney. However, as time passes and elimination of the Kupffer cells through the central vein of the liver is established, these large cells are picked up in the blood stream, and carried through the right heart into the

lung. Irwin has demonstrated these cells in the upper part of the trachea lying on the surface, pointing to the elimination of the thorium dioxide by the respiratory system. This observation is, we believe, original on his part, none of the other investigators mentioning it in their work.

During the nine months that Drs. Macdonald and Irwin have been carrying out their observations no untoward reaction has occurred in any of the animals. Rabbits which were given their initial dose at the start of the investigation have been checked at frequent intervals for change in weight and any abnormality in hepatic or splenic function, and none whatever has been demonstrated. In fact, they appear as healthy and normal animals throughout the period. This finding corresponds with those of the continental workers, and we feel we may now state that no damage will result in the administration of thorium dioxide to the patient, particularly as the dosage used is so much smaller than the larger ones given to the control animals. In the animals sectioned from time to time, some within a few days after receiving their intravenous injection and others at intervals during the investigation, the last observations having been made only a few days ago, no microscopic evidence of structural change or damage can be demonstrated; all the sections of the various organs show perfectly normal structure, with the exception of the thorium deposit in the cells of the reticulo-endothelial system. Surely if any pathological change would occur, some microscopic evidence of it should be available now.

The question of the elimination of the thorium dioxide has undoubtedly been already asked by you. During the laboratory examinations no elimination of any appreciable amount was found during the first few weeks. In sections made of spleen, liver and bone marrow shortly after the administration of the thorium dioxide, minute deposits of the salt could be seen in the cells of the reticulo-endothelial system. As the weeks passed the Kupffer cells in the liver gradually increased in size, larger deposits of the thorium salt were present, and the cells appeared to migrate towards the central vein. In several sections these cells loaded with thorium dioxide were observed within the venous vessels of the liver, and as this phenomenon was noted the large cells became visible in the lung, definitely pointing toward

elimination from the liver by this route; at the same time the shadow of the liver became slightly less dense and in three months showed radiographically about 50 per cent of its original content. Sufficient time has as yet not elapsed to allow a statement as to the period required for complete elimination. The spleen, bone marrow, lymph glands, and ovary have as yet given no evidence of elimination. The thorium dioxide present in animals examined recently who have received their initial dosage at the commencement of this investigation, shows about the same amount present in these latter structures as the animals demonstrated within a few days of their initial reception of the salt.

Radioactivity has been proved to be absent. Films exposed for several days to heavily impregnated sections of liver and spleen show no reaction upon the films, the latter developing out as an absolutely unexposed film. Concentrated liver pulp of rabbits receiving large doses of thorium dioxide gave no reaction of any importance with the electroscope.

Thorium, as we know, possesses a very short wave length, and the wave length of its secondary radiation when bombarded by x-rays is also very short. With long-continued storage of the thorium dioxide in the liver and bone marrow, the question of exposure to radiation from the x-ray tube in cases suffering from metastases in these areas is an interesting one. At the present time Dr. Richards is carrying out research along these lines.

During the animal experiments and during the administration of the solution to patients, no reaction was observed in our work. Some investigators report slight rises in temperature accompanied by headache. This has always been stated to be so slight as to cause no alarm. If the solution be heated to body temperature and administered slowly these reactions will be eliminated. While these animal experiments were being carried out, and until we were satisfied that no harmful reaction could occur to the patient, we made a hard and fast rule that only patients past medical or surgical aid should receive thorotrast in our department. Only cases such as carcinoma with proved metastases in the liver were first used; then patients with extensive carcinoma of the stomach or bowel were given thorotrast, to

demonstrate the presence or absence of metastases; and later cases of typical cirrhosis of the liver received the drug and films were made.

TECHNIQUE

Our technique was as follows in these cases. A daily dose of 25 c.c. of thorotrast was administered intravenously for three days, a total of 75 c.c. in all being received by the patient. On the fourth day, films were made of the abdomen on the Potter-Bucky Diaphragm, and followed by films daily for several days, using the same time, distance, K.V. and M.A. factors until the greatest deposit of the dioxide was noted in the liver and spleen.

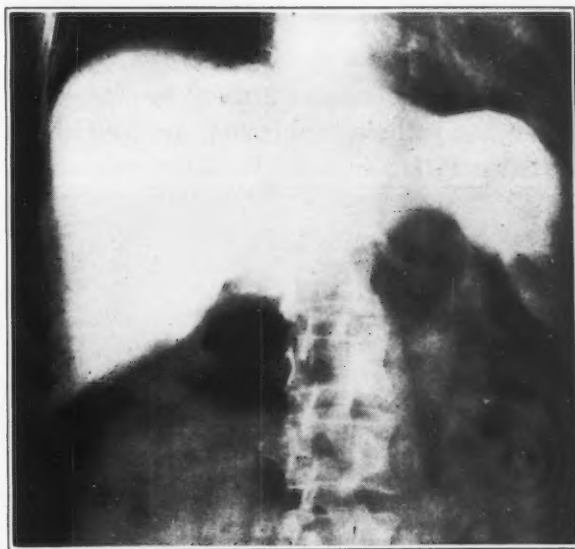


FIG. 1.—Normal liver and spleen impregnated with thorium dioxide.

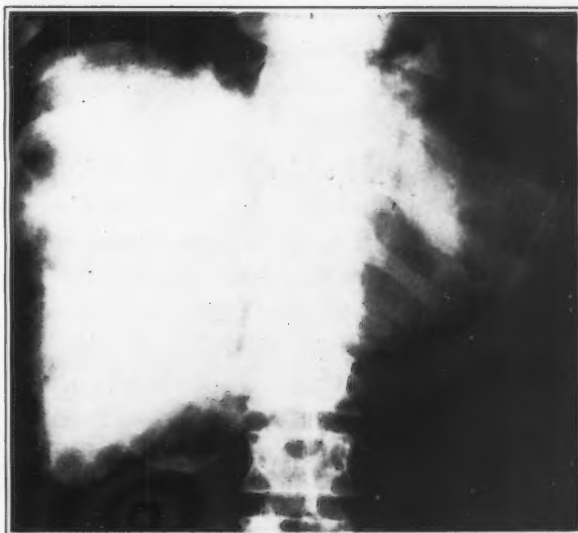


FIG. 2.—Marked metastases in liver. Note the honeycomb effect where no thorium dioxide has been deposited, indicating metastases.

A well outlined liver, smooth and homogeneous in density, we believe definitely rules out the presence of any carcinomatous change. Metastases are seen as areas lacking in thorium deposit and having a punched-out appearance. The spleen usually is shown as a smooth shadow of equal density throughout; complete absence of the spleen shadow may be due to thrombosis of the splenic artery, or to leukæmia. Enlargement of the spleen is very easily demonstrated. Several of our cases of cirrhosis accompanied by splenic enlargement were well demonstrated. Cysts and tumours of the spleen will show as negative shadows in the surrounding healthy spleen tissue; in other words, any damage to the reticulo-endothelial cells will cause an absence of thorium dioxide deposit.

Beside the metastases present so often in the liver, other pathological lesions are well demon-

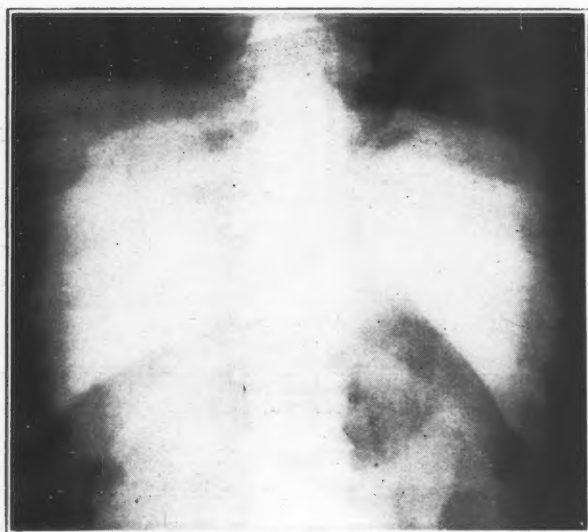


FIG. 3.—Cirrhosis of liver. Note decreased size of liver and enlarged spleen.

strated. Here, cyst and abscess are delineated by the utter absence of the salt in the diseased region, surrounded by a smooth, homogeneous shadow in the uninvolved areas. Cirrhosis of the liver shows a shadow much decreased in density, with the liver shrunk in size. At first we considered this lack of density due to the presence of ascites, but after the fluid had been removed our liver shadow was still below normal, and we concluded it was due to a general impairment of the absorptive action of the Kupffer cells. This method will also be found of great advantage in a differential diagnosis of abdominal tumour in the left and

right hypochondrium. How often have we laboured to differentiate spleen from kidney in tumour formation, or perhaps a tumour of the adrenal gland! A normal, well outlined spleen after the administration of the thorium dioxide, and the minute deposits in the adrenal gland, leave only the question of kidney or retro-peritoneal sarcoma. Pyelography will easily condemn or acquit the kidney, so by elimination a problem of this type should not present great difficulties. The study of the enlargement and shrinkage of the liver and spleen under different circulatory conditions has also been accomplished by this method. For a detailed account see the work of Paffenholz and Shuermeyer.⁴

If these were the only demonstrable uses for the new contrast medium we might well be satisfied, but the further application of this oxide to the diagnosis of disease in other systems and regions gives one the impression of having become the owner of Aladdin's lamp. Studies of the vessels of the brain have been carried out with brilliant results and no evidence of injury. Iodine and bromine, when used for this type of work, are not without disadvantages. Thorotrast is not toxic, produces no irritating effects, and possesses higher opacity than the bones of the skull. Patients suffering from arteriosclerosis tolerate its use extremely well, and as its administration is painless, no anæsthetic is needed. It also allows the films of the skull to be made in any direction; previously it could only be done with the head on either side. This allows an exact localization of any tumour or block in the arterial system.

To obtain stereoscopic films, 8 to 15 c.c. of thorotrast are introduced into the common carotid through a platinum needle, 1 mm. in diameter, bent or bayonet-pointed. The injection is given slowly and the exposures are made while the solution is flowing into the common carotid. The needle should lie well within the lumen of the artery and the injection preferably carried out from the right side. Several articles have been published by Moniz *et al.*⁵ where this method has been used in the study of brain tumours, atheromatous changes of the encephalic arteries, and in suspicious cases of meningitis, with absolutely no injury and brilliant results for the patient.

The same solution may be applied to the study of the arterial system of the limbs and the

abdominal aorta. After puncturing the artery with the platinum needle, the thorotrast is injected, the amount being 12 to 18 c.c., allowing about seven seconds for the injection, and films are made immediately. This period is needed to fill the arterial system. Localization of thrombosis, embolism, and development of collateral circulation may all be demonstrated.

The thorotrast solution may be used in retrograde pyelography. It is miscible with all body fluids without becoming flocculated. It is non-irritating and lacks the disadvantages of the iodine solution, as no cramps are produced, and the greater opacity of the salt produces a better radiogram than the iodide solution. In the examination of the urethra, on account of its thinner flowing, it will penetrate into the ducts of the urethral glands, fistulae, and the opening of abscesses of the prostate. It is also of great advantage in the study of chronic prostatitis. Thorotrast also may be injected in various pathological lesions involving the lungs. Fistulous tracts in empyema are well outlined; bronchial fistula have been filled with the solution with no untoward effects. Bronchiectatic cavities of both the saccular and cylindrical types have been filled with the thorium dioxide, and as the solution has a not unpleasant taste it thus adds to its advantages. Kresmer,⁶ to test the harmlessness of the solution, filled the lung of an animal and left it for three months with no deleterious effects on the animal's health.

Obstetrics is also a debtor to this contrast medium. We are all aware of the difficulty in diagnosing placenta prævia and placenta

marginalis. Fortunately we have here a splendid aid. Ehrhardt⁷ in his experiments on white mice showed the placenta as round or oval discs, each placenta showed the same density, and he was able to foretell accurately the number of fetuses present. Liepmann,⁸ in the human being, by the use of thorotrast was able to demonstrate the size and position of the placenta. He administered various doses from 10 to 25 c.c. slowly, and obtained the outlines of the placenta.

In all of our patients, totalling now 18, who have received thorotrast during the last nine months, no unfavourable reaction has occurred, nor could any undesirable result be demonstrated. Some of the observers state that the solution is contraindicated in cirrhosis of the liver and marked damage to the spleen. Our experience with cirrhosis has been that no damage occurred to any patient whatsoever.

In conclusion, it is our firm belief that we have in this contrast medium one that is absolutely harmless to the patient and of invaluable aid in the diagnosis of lesions previously beyond us. With the advance it has made in the last eighteen months it is impossible to do more than speculate as to new uses for it in the future.

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MUCIN THERAPY FOR PEPTIC ULCER. — Brown, Cromer, Jenkinson and Gilbert, Chicago report that 36 out of 37 patients who had partial to complete disability on previous strict ulcer management were relieved objectively and subjectively by mucin. Roentgen deformities in topography were influenced more by administration of mucin than by former management. Emptying time or retention was diminished on mucin treatment. Disappearance of gross and occult blood in stomach and stools was more rapid with mucin treatment than with conventional management. Mucin treatment was effective in controlling several massive hæmorrhages from the stomach. Other methods were also effective. There have been no recurrences in 36 patients who had frequent previous recurrences. Hyperacidity, as measured by weekly Ewald test meals, was not lowered on the treatment of hourly feedings and powders and was only somewhat lowered by mucin treatment. All

the patients were taken off powders or mucin and food twelve hours previous to the test meal. Mucin in ordinary doses did not lower gastric acidity appreciably when placed in the stomach after a two hour fractional meal followed by aspirations at frequent intervals for from four to seven hours. In the mucin used the authors did not observe any secretagogue action which interfered with the beneficial effect. From their objective observations, the therapeutic effect is due to some factor other than neutralization of acid. There has been a notable increase in the feeling of well being and an improvement in the appearance and behaviour of the mucin-treated patients. The authors have found in the past that a majority of peptic ulcers heal with no treatment or any treatment. The minority are sometimes very resistant to the best forms of management. Mucin has helped these intractable cases.—*J. Am. M. Ass.*, 1932 99: 98.

THE EXPERIMENTAL INTRAVENOUS ADMINISTRATION OF COLLOIDAL THORIUM DIOXIDE*

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DURING the past two years many workers have published communications on the use of colloidal thorium dioxide in roentgenology, as introduced by Radt.¹⁶ The sequelæ of intravenous injection in experimental animals have been reported by a number of investigators. In this communication, similar experimental work is reported, done during the last few months in this department. Twenty-five healthy rabbits were used in these experiments. Varying initial doses of the thorium compound were given and the animals examined at intervals. In other animals small daily doses were given for a period of two months. The clinical course and the changing density of the liver and spleen to roentgen rays were observed, and the blood and urine examined. The tissues were examined histologically. Two chickens bearing experimental Rous sarcoma were used also to ascertain the presence or absence of thorium in the malignant tissue.

Thorium dioxide (abbr. ThO_2) is a very stable compound of thorium which has the property of absorbing roentgen rays. The particular preparation used in this work was a 25 per cent colloidal solution of ThO_2 in serum, known commercially as "Thorotrast".† This preparation mixes readily with blood in any proportion without the formation of any visible clot. When alcohol is added to this preparation the ThO_2 is quickly thrown down as a white precipitate, and hydrochloric acid, which had been adsorbed to the ThO_2 to maintain its colloidal state, is freed.

REACTION TO THE INTRAVENOUS ADMINISTRATION OF THORIUM DIOXIDE

In all animals used in this work the ThO_2 solution was introduced into the marginal ear

vein, undiluted, at room temperature, and as fast as a small needle would permit. No untoward clinical symptoms were observed in any of the animals during or immediately following the intravenous injection. Kadrnka⁴ advised a 1-10 dilution of the preparation in serum containing 5 to 10 per cent glucose. This was given slowly at body temperature. He⁵ also mentioned occasional reactions following intravenous administration, similar to a foreign protein reaction. This reaction was probably due to the serum portion of the preparation and not to the ThO_2 *per se*.

Most of the animals lost slightly in weight for a few days following administration, but this was recovered quickly. Some showed a hæmoglobin loss as high as 10 per cent that disappeared in a few days. Kadrnka⁶ reported a mild transient decrease in the erythrocytes. Lambin⁹ found a pronounced anæmia following single large doses, recovery being spontaneous. The degree of anæmia was less when he gave similar amounts in divided doses.

DOSAGE

Lambin⁹ reported 5 c.c. per kilo. necessary for rabbit liver visualization, though the spleen in the same animal required only 1 c.c. per kilo. for comparable contrast. Kadrnka⁴ found 0.8 to 1.0 grams per kilo. necessary for average contrast in rabbits. He recommended dividing that amount into 4 to 6 doses. Muramatsu¹² found 0.7 c.c. per kilo. sufficient for spleen and liver visualization in rabbits. In this experimental work it was found that proper visualization of liver and spleen in rabbits was difficult, due to a rapid respiratory rate and a relatively large stomach. If the stomach was empty and the roentgen exposure short, the liver and spleen were seen faintly when 0.25 c.c. per kilo had been given. The density of these organs increased proportionately with the dosage and good contrast was present after a total of 0.8 to 0.9 c.c. per kilo. had been given. Little

* Submitted for publication July 7, 1932.

† "Thorotrast" is prepared by the Heyden Chemical Corporation, New York, to whom we are grateful for the supply used in this work.

change was noted in the density of these organs until a total of 1.8 c.c. per kilo. had been reached. At this point the density was marked.

DISTRIBUTION OF AND TISSUE REACTION TO THORIUM DIOXIDE

Leipert¹⁰ found the thorium exclusively in the liver and spleen, with a minimal amount in the kidney. He also reported the absence of thorium in tumour tissue. Kadrnka⁷ found the thorium in liver, spleen, bone marrow, lung and adrenal glands of rabbits. Randerath¹⁷ reported finding thorium in the human liver, spleen, bone marrow and adrenal glands, and none in carcinoma metastases. All experimenters agree that this preparation of thorium dioxide, when given in doses up to 5 c.c. per kilo. (i.e., six times the dose necessary for visualization of liver and spleen), causes no untoward tissue reaction up to periods of at least one year. Huguenin² reported hepatitis and liver cirrhosis in rabbits following doses of 10 c.c. per kilo. Kadrnka⁴ reported one animal healthy 3 months after a dose of 14 g. per kilo.

Baumann and Schilling¹ found a fading liver and spleen shadow from the 20th day after administration. Kadrnka⁴ found liver contrast diminished by half at the end of 3 months. The same author⁶ assumed that some thorium was eliminated through the lungs. Naegeli and Lauche¹³ found no ways of elimination. Popper and Klein¹⁴ were of the opinion that practically no elimination occurred in 2 months. Huguenin and Nemours³ reported pronounced opacity of liver and spleen 5 months after administration.

TECHNIQUE

The animals were killed and the tissues removed immediately to 10 per cent formo-saline for fixation. As a routine, paraffin sections stained with hæmatoxylin and eosin were made of 20 of the more important organs, for microscopic examination. Frozen sections stained for fat with Sudan 3 were made of liver and kidney. ThO₂ was easily detected microscopically, and appeared as a finely granular, highly refractile, grayish bronze material of metallic appearance, in stained or unstained sections. Huguenin, *et al.*² found that aniline blue selectively coloured the ThO₂, but such staining was found to be unnecessary.

GENERAL FINDINGS

ThO₂, given intravenously to rabbits in doses up to 5 c.c. per kilo., was found in large amounts in the liver, spleen, bone marrow, lymphoid tissue; in small amounts in the adrenal and ovary; and in traces in the kidney. This material was found to be engulfed only by the reticulo-endothelial cells of these organs, with the exception of the parenchymatous cells of liver and adrenal. When given subcutaneously, the ThO₂ was soon engulfed by the histiocytes. The presence of ThO₂ was found to be innocuous to the containing or surrounding cells. There was no evidence of leucocytic infiltration, fatty degeneration, granulomatous reaction, fibrous proliferation, or other untoward reaction in four months after doses as large as 5 c.c. per kilo. One animal suffering from extensive coccidioid infestation of liver showed complete absence of ThO₂ in the cyst walls or cavities. The chickens bearing experimental Rous sarcoma failed to show any ThO₂ in the malignant tissue following large intravenous doses.

Liver.—Relatively, the liver engulfed slightly less ThO₂ than the spleen. The amount present in the liver was proportional to the amount of ThO₂ given intravenously. The ThO₂ was only found in the cytoplasm of the parenchymatous and Kupffer cells.

If 1 c.c. per kilo. was given at one dose and the liver examined in 48 hours, the ThO₂ was present in the cytoplasm of practically all the parenchymatous liver cells. It was seen as small, finely granular collections distributed fairly evenly throughout the cytoplasm. There was no typical zonal distribution, though a greater concentration was occasionally seen in the liver cells of the outer zone. The majority of the Kupffer cells contained similar collections of ThO₂, but not to the extent of displacement of the nucleus or marked bulging of the cell. These Kupffer cells were distributed in a uniform manner throughout the lobule. Hyperplastic aggregations of Kupffer cells were seen in some areas. This reaction coincided with a local increase of the ThO₂ content. It was interesting to note that many of the Kupffer cells contained no ThO₂, though frequently adjacent to Kupffer cells laden with that material. Variations of the dose or the time

interval after injection apparently did not induce engulfing of ThO_2 by these cells. At this stage, with this dosage, there was no evidence of leucocytic infiltration, cloudy swelling or any other type of damage. Frozen sections, stained with Sudan 3, showed no increase in the occasional intracellular fat granules usually seen in the livers of healthy control animals. There was no ThO_2 in the cells or lumina of the bile ducts.

Following larger doses (3 to 5 c.c. per kilo.) the 48-hour liver (Fig. 1) showed an increase in amount, but no change in ThO_2 distribution. The liver cells showed granules of the same size seen in a 1 c.c. per kilo. dose, but the number of granules present was increased proportionately to the dose given. No evidence of

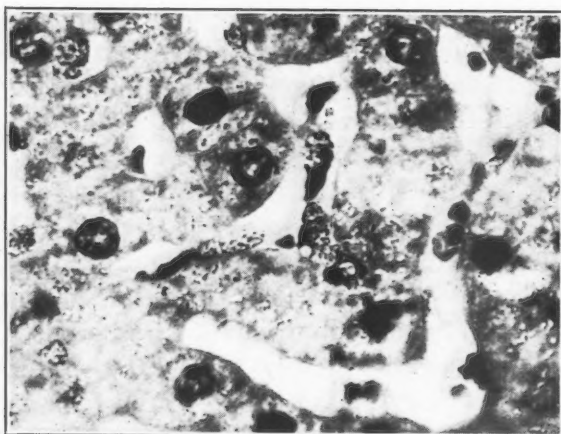


FIG. 1.—High power of liver at 2 days, showing thorium particles within the liver and Kupffer cells.

liver damage was seen with these larger doses. One month after an intravenous dose the liver showed a slightly altered appearance. The ThO_2 granules in the liver cells were larger and fewer in number, and gave the appearance of having been formed by the aggregation of several of the granules seen in the 48-hour liver cells. The Kupffer cells were much larger, and were oval or round. The entire cytoplasm was filled with finely granular ThO_2 displacing the nucleus, which stained well, to the periphery of the cell. There was no evidence of leucocytic infiltration, necrosis, fibrosis, fatty change or other damage in any of the cells of the liver. The zonal distribution of the ThO_2 was not altered from the 48-hour picture.

Two months after the injection of ThO_2 there were definite changes in the thorium distribution. The liver cells contained fewer ThO_2 granules, which were slightly larger than the

one month granules and tended to collect about the periphery of the cell. ThO_2 -laden Kupffer cells were more numerous, though not changed in appearance or ThO_2 -content from the one month appearance. These cells now occupied the middle and inner lobular zones with the exception of a few cells which were found in the region of the portal vein. These Kupffer cells in the inner zone were frequently grouped together in compact aggregations of 5 to 10 cells and only rarely were multinucleated cells seen. No evidence of liver damage was present.

At three months the liver cells contained still fewer ThO_2 granules. The Kupffer cells did not seem to be increased in number and were usually tightly packed around the central vein (Fig. 2). Frequently masses of these cells

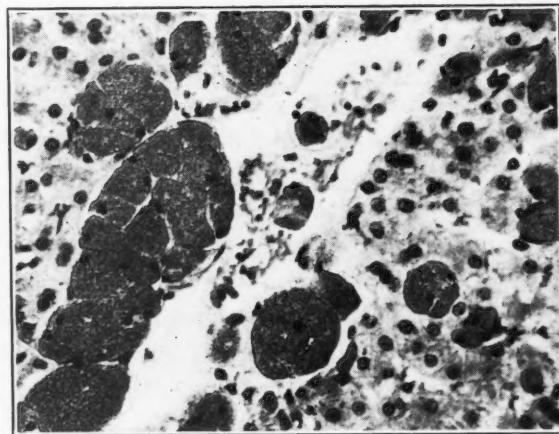


FIG. 2.—Low power of liver at three months, showing thorium-filled Kupffer cells closely aggregated about a central vein area. Two free, thorium-containing cells are seen within the vein lumen.

were seen bulging into the lumen of the central vein. They still maintained, with rare exceptions, cellular individuality, and their nuclei stained well. Occasionally ThO_2 -laden cells were seen in the blood of the sublobular veins that were morphologically identical with the ThO_2 -Kupffer cells about the central vein.

At four months the liver cells contained still fewer granules. The Kupffer cells had the same distribution as seen at three months, though their number was apparently less. Occasional ThO_2 -laden cells were seen in the sublobular veins and had the same morphology as the cells seen in the liver at three months. No evidence of liver damage was present at this period.

Spleen.—The spleen retained relatively large quantities of ThO_2 . As in the liver the distribution of the ThO_2 following large doses (5 c.c.

per kilo.) was the same as with smaller doses (0.5 c.c. per kilo.), the difference being only in the amount of ThO_2 present.

At 48 hours many of the cells of the reticulum were bulging with ThO_2 and morphologically resembled the ThO_2 engulfing reticulo-endothelial cells elsewhere. In the periphery and centre of the Malpighian corpuscles many similar ThO_2 -laden cells were seen. At this stage much of the ThO_2 lay free in a finely divided state in the reticular spaces. At the end of 2 weeks the free ThO_2 of the reticular spaces had greatly diminished and apparently corresponded to an increase in number and size of the ThO_2 -containing reticular cells. These cells were now aggregated and for the most part were fused to form giant cells containing 10 to 25 nuclei. Giant-cell formation was typical of the ThO_2 -cells of the spleen, and differed from other tissues where similar cells maintained their individuality. At one month all the free ThO_2 of the reticular spaces had disappeared, apparently engulfed by the reticular cells. The ThO_2 was contained entirely by the reticular cells that for the most part had fused to form giant cells. This appearance did not differ from a spleen examined at 4 months, in ThO_2 -content or distribution. Up to a period of 4 months no evidence was seen of any damage to the splenic cells or reaction due to the presence of ThO_2 .

Adrenal.—The cells of the adrenal cortex engulfed ThO_2 . No ThO_2 was observed in the cells of the medulla. At 2 days the elongated cells lining the blood channels between the columns of the zona fasciculata engulfed most of the ThO_2 , but some was present in a very loose arrangement of fine granules in the cytoplasm of columnar cells. As time went on, these cells gradually shifted to the deeper portion of the zona fasciculata and to the zona reticularis. The columnar cells soon lost their ThO_2 , which was apparently picked up by the lining cells of the blood channels. At 3 months practically all the ThO_2 was arranged in spherical, eccentric nucleated cells in close relationship to the venous spaces of the outer zone of the medulla (Fig. 3). At 4 months the picture was the same, though the number of ThO_2 -laden cells might have been slightly decreased. No evidence of any damage to the adrenal gland by the presence of ThO_2 was seen.

Bone marrow.—The bone marrow was found to contain large amounts of ThO_2 in all cases. Unlike the spleen and lymphatic tissue, the bone marrow ThO_2 apparently did not collect extracellularly in the reticulum, but was found within the reticular cells from the first. The ThO_2 -containing cells, morphologically resembled similar cells in the liver and lymphatic glands. These cells did not aggregate in large clumps as in the liver, spleen and lymphatic tissue but remained more or less discrete. The appearance of the bone marrow remained remarkably constant from the first up to a period

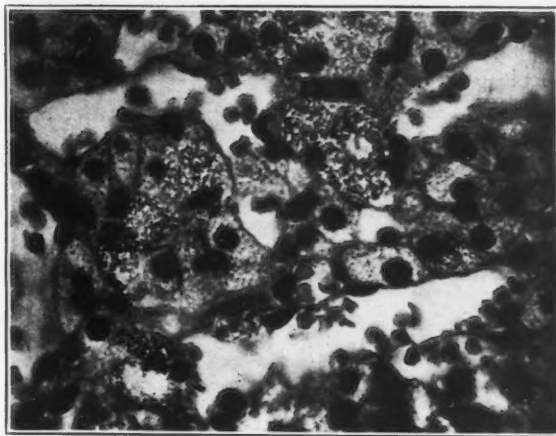


FIG. 3.—High power of junction of adrenal cortex and medulla at three months, showing aggregation of thorium-containing cells about the venous spaces.

of 4 months. The presence of ThO_2 had no effect on the activity of the bone marrow parenchyma, nor did it give rise to any pathological reaction in that tissue.

Lymphatic tissue.—The reticulo-endothelial cells of lymphatic tissue were found to engulf ThO_2 and presented much the same appearance in all parts of the body. The lymphatic glands of axilla, groin, mesentery, and the lymph tissue of the gastrointestinal tract and bronchial tree, all contained ThO_2 , in a manner common to all. The ThO_2 -engulfing cells were morphologically identical with the ThO_2 -containing reticulo-endothelial cells elsewhere, *i.e.*, cytoplasm entirely filled with ThO_2 , spherical in shape, and the nucleus round and eccentric.

At 48 hours many small granules of ThO_2 were found lying free in the reticular spaces of the gland, though much of the ThO_2 was engulfed at this stage. At 7 days practically all the free ThO_2 had been engulfed, and the picture presented by the gland at this time was unaltered up to a period of 4 months. The

ThO₂-containing cells were found in the periphery or central part of the lymphatic nodules and also in the reticular portion of the lymphatic tissue. In the lymphatic nodules the ThO₂-cells were usually in compact groups of 5 to 15 cells, usually maintaining cell individuality. In the reticulum the cells occurred singly, or in small groups of 2 to 4. No evidence of ThO₂ elimination was observed up to a period of 4 months. No sign of any pathological process referable to the ThO₂ was observed during that period.

Lung.—Following a dose of 1 c.c. per kilo., the lung, examined at 48 hours, showed occasional alveolar epithelial cells containing

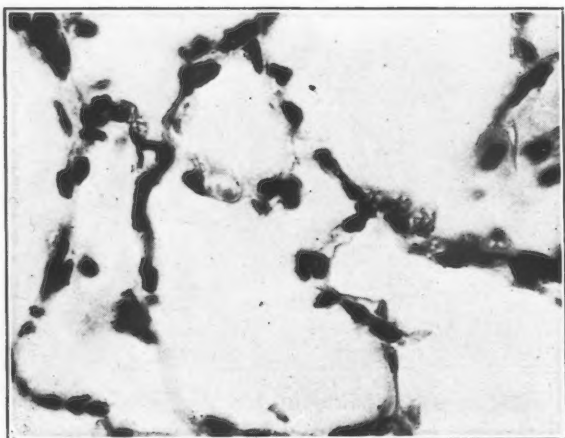


FIG. 4.—High power of lung at 2 days, showing small collections of engulfed thorium in alveolar epithelium.

small amounts of ThO₂ in their cytoplasm (Fig. 4). The amount of ThO₂ present in these cells was not sufficient to obscure the cytoplasm or distort the cell outline. Occasionally these cells were found lying free in the alveolar spaces or in the lumen of the bronchioles. At one month the lung was found to be practically free of ThO₂. From two to four months large, spherical cells, with eccentric nucleus and cytoplasm, entirely filled with ThO₂, were seen, usually singly, in the capillaries of the alveolar walls. These cells bulged the capillary walls and apparently were held *in situ* by virtue of their size, being about 20 μ in diameter. In some cases these cells were seen bulging into or lying free in the alveolar spaces. These cells were seen occasionally in the mucus of the bronchioles and trachea. They were also observed in the blood of the small arteries of the lung. As similar cells were not seen in the

veins, it was probable that they were excreted by the lung.

In larger doses (3 to 5 c.c. per kilo.) the 48 hour lung showed the number of alveolar cells containing ThO₂ to be increased, but the amount of ThO₂ in the individual cells was not increased when compared with the picture presented by smaller doses. The spherical ThO₂-laden cells occasionally seen in the blood of the smaller lung arteries were seen in the alveolar capillaries as early as the fourth day. During the first month their numbers increased and they were seen at that time in the alveolar spaces and in the mucus of the bronchi and trachea. There was little change in the ThO₂-

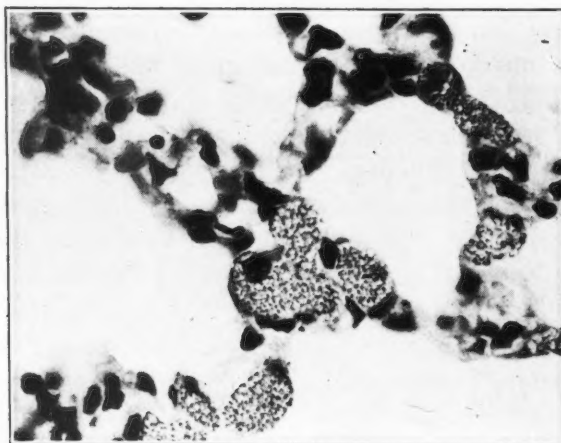


FIG. 5.—High power of lung at two months, showing large thorium-containing cells lodged in alveolar capillaries.

content of the lung at the end of 4 months. (Fig. 5).

No evidence of untoward reaction was observed in the lung at any period that could be attributed to the presence of ThO₂. The ThO₂-cells in the alveolar spaces, bronchi and trachea were occasionally surrounded by polymorphonuclear leucocytes.

Ovary.—Certain cells of the ovary engulfed ThO₂. These cells were present in small numbers and usually occurred singly. The engulfing cells were evidently the reticular cells supporting the lutein cells and in structure resembled the stellate cells of the liver. The amount of ThO₂ present was not sufficient to bulge the cell to any marked degree or displace the nucleus. In some areas the lutein cells evidently engulfed small amounts of ThO₂ in a manner similar to the liver cells. No ThO₂ was seen in any of the cells of the Graafian follicles. The ThO₂ present in the ovary persisted for at

least 4 months and apparently did not change in amount or distribution during such a period. No evidence of any damage due to the presence of ThO_2 was present.

Kidney.—The kidney was found to be almost entirely free of ThO_2 . Following some search, a few small granules were usually found in the glomerular tufts or within the tubules of the kidneys of animals up to a period of 2 weeks. These granules were almost without exception extracellular. It was rare to find any ThO_2 in the kidneys after an interval of 2 weeks or more from the time of injection. One exception was found in a kidney where a nephritis was present, a condition not uncommon in laboratory animals. A marked increase in the ThO_2 -content was present in extracellular, granular form, principally in the glomerular tufts and tubules. Naegeli and Lauche¹³ found a similar concentration in inflammatory areas in lung.

Blood.—Blood smears made less than 5 minutes after ThO_2 injection, failed to show the presence of any flocculated ThO_2 . Smears examined after allowing a 10 minute interval showed small particles of flocculated ThO_2 . These small particles were found in blood smears 48 hours after injection, but were not seen at later periods. The blood cells did not engulf ThO_2 , with the exception of an occasional endothelial cell that contained a few fine granules of ThO_2 . Huguenin *et al.*³ report that in arteriography the vessel shadows fade rapidly after an interval of 5 minutes, which corresponds with the flocculation of the colloidal ThO_2 . Apparently there is some relationship between the fading blood vessel shadows and the flocculation of the colloidal thorium dioxide.

Urine.—Rabbits having albumin-free urine prior to thorium dioxide injection invariably maintained an albumin-free condition, following administration.

SUMMARY

A 25 per cent colloidal solution of ThO_2 when injected intravenously into rabbits circulated for about 5 minutes in the colloidal state and then flocculated. The flocculated particles were engulfed, for the most part, by the reticulo-endothelial cells of liver, spleen, lymphatic tissue and bone marrow and by the paren-

chymatous cells of the liver. A moderate amount was lying free in the reticulum of the spleen and lymphatic nodes. A relatively small amount was picked up by the adrenal gland and ovary. The ThO_2 in a finely divided state in the liver and spleen absorbed many of the roentgen rays that usually penetrated these organs, resulting in a shadow which permitted their visualization. The shadow cast by the bone marrow was obscured by the covering bone. In large doses the lymphatic glands could be visualized. The adrenal and ovary contained relatively so little ThO_2 that the dosage required for visualization would necessarily be tremendous and impractical.

The presence of ThO_2 was innocuous in the tissues and no untoward reaction due to its presence has been observed in doses up to 5 c.c. per kilo., during a period of 4 months.

No evidence of elimination of ThO_2 from the spleen, bone marrow, lymphatic glands or ovary has been observed in a period of 4 months. There was evidence that the ThO_2 -laden cells of the adrenal gland were passed very slowly into the adrenal vein and probably were later caught in the lung capillaries. The ThO_2 of the liver cells gradually accumulated in the Kupffer cells, which migrated to the central vein area, passed into the blood stream, and through the right heart to the lungs, where they stuck in the capillaries and eventually were cast off in the bronchial mucus.

I wish to acknowledge my indebtedness to the Department of Radiology, Toronto General Hospital, for their kind cooperation in this work, and to Dr. W. H. Dickson, of that Department, at whose suggestion this work was instigated.

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THE USE OF THORIUM DIOXIDE AS AN AID TO CLINICAL DIAGNOSIS

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THE diagnosis of intra-abdominal tumours has always been a perplexing problem to the clinician. Even with the help of the radiologist in visualization of the gastro-intestinal tract it is often difficult to determine the type, origin and progress of the palpable abdominal mass. Out of this have grown efforts to produce some contrast medium which, when injected intravenously, will render certain essential organs visible in anatomical detail under x-ray. Research workers have shown that the widely distributed reticulo-endothelial system is capable of picking up in a specific manner finely particulate substances injected into the blood stream. Given that such a substance were opaque to the x-ray and without general toxic or local irritative effect, the accurate roentgen visualization of certain organs thus becomes possible.

Latest of these, and with which this communication is concerned, is thorium dioxide. According to available literature, this substance was first used clinically in the early part of 1931 by Radt and Krynski. Since this time many reports concerning its use in small series of cases have appeared, mainly in the German literature. Although laboratory work shows that it is picked up in appreciable amounts by the reticulo-endothelial system everywhere, its main use, clinically, has been in visualization of the liver and spleen—hepatolienography. Thorium has also proved valuable in the hands of certain investigators as a contrast medium in the roentgenograph of hollow viscera and blood vessels. Injected into the carotids, it serves as an excellent means of arterial encephalography, and it is equally valuable in making arteriograms of the extremities. The field of usefulness of thorium dioxide in roentgen visualization may be listed as shown opposite.

The experience of other investigators, as reported in the considerable foreign literature now available on the subject, was reviewed with reference to possible untoward sequelæ following the intravenous injection of thorium. The commercial preparation "Thorotrast" has been the only one employed. The dosage commonly

accepted as producing satisfactory visualization is 0.8 c.c. per kilo. of body weight. Kadrnka and Rossier, giving doses of the dioxide much larger than this, found no ill effects other than a transient hæmoglobinuria and a mild decrease in erythrocytes. Kadrnka remarks that its use is contra-indicated where there is co-existent hepatic and renal insufficiency. Radt observed a slight elevation of temperature following the injection of thorium in patients who were previously toxic or markedly cachectic. Severe icterus he considers a contra-indication. Randerath performed two autopsies on patients who had received thorium. He found the inert metal present in the same distribution as found in experimental animals, with no evident reaction. One of his patients had received more than twice the ordinary dosage.

Since November, 1931, 18 cases in which thorium has been given intravenously have come under observation at the Toronto General Hospital, mainly from the medical and surgical services. The commercial preparation, "Thorotrast", has been used. This is a 25 per cent solution of thorium dioxide as a highly dispersed sol in serum. The technique has been the same in each case. Three injections of 25 c.c. are given, with two days between each. The thoro-

A. BY INTRAVENOUS INJECTION

<i>Indication</i>	<i>X-Ray Appearance</i>	<i>Information Obtained</i>
1. Masses in hypochondrium	Displacement of spleen or liver shadow.	Association of liver or spleen to mass.
2. Cirrhosis Leukæmia	General diminution or absence spleen or liver shadow.	Degree of involvement.
3. Tumours Cysts Abscesses	Localized area or areas in liver not visualized.	Presence of metastases. Position of abscess, cyst, etc.
4. Splenic thrombosis	Absence of splenic shadow.	

B. AS A LOCAL CONTRAST MEDIUM

1. Fistulæ.
2. Empyemata.
3. Body cavities.
4. Genito-urinary tract.

trast may be given warmed to 37 degrees, but must be given slowly, taking at least five minutes on each occasion. Plates are not taken until 24-48 hours after the last injection, and should be preceded by a high enema. The same radiological technique is used as in taking stereoscopic plates with any contrast medium. The films obtained are simple of interpretation.

Of the 18 patients who have come under observation, 10 were closely followed, before and after the use of the drug, for periods varying from three weeks to five months. Urinalyses were done at frequent intervals, the blood picture contrasted with that before the use of thorium, and in certain cases a blood Van den Bergh determination was done. None of these showed the slightest indication of change consequent upon the intravenous administration of thorium. Only one patient manifested an immediate reaction. This individual developed a moderate febrile reaction following the first injection. This subsided promptly, and after three days' delay the remaining injections were given without further disturbance. This occurred in a patient who had been ill for many weeks. Such a febrile reaction may well be due to the presence of serum-proteins in thorotrast.

As in the majority of reports in the literature, this series of cases has been mainly concerned with the detection of hepatic metastases from intra-abdominal carcinoma. A comparison of the x-ray plates with the anatomical findings at operation in at least three cases showed conclusively the accuracy with which the metastases were shown radiographically. On two occasions also the contrast of the x-ray plate with the gross appearance of the liver demonstrated how few metastases one could actually see on the surface

of that organ compared to the number seen in the film. At the moment, this appears a most valuable addition to the investigation of patients suspected of having malignancy of the gastrointestinal tract, for many futile abdominal explorations will be avoided when the presence of metastases has been thus established. In two cases of this series exploratory operation was denied the patient after visualization of multiple hepatic metastases.

The citation of one case will serve also to illustrate the value of hepato-lienography as an aid to diagnosis. A forty-year-old woman presented a tumour mass in the hypochondrium, without definite diagnosis, and concerning which there was considerable variance in opinion. Radiological evidence and other investigation presented contradictory findings. Her appearance was that of early cachexia due to carcinoma. Visualization of the liver showed one large and multiple small metastases.

None of the patients in this series has yet come to autopsy.

From the clinical and laboratory evidence to date one cannot detect any disturbance consequent upon the use of thorium *per se* intravenously. Febrile reactions when present are probably due to the serum-vehicle. The advantages of hepato-lienography are as definite as they are obvious, and its field of usefulness should constantly widen with increased experience in its administration.

This work has been carried out in association with the Radiological Service of the Toronto General Hospital, and particularly with Dr. H. W. Dickson, Associate Director of the Department. The clinical material has been obtained from the services of Prof. W. E. Gallie and Prof. D. A. L. Graham.

For full bibliography see papers in this issue by Drs. Dickson and Irwin.

COMPARATIVE STUDIES ON MERCUROCHROME AND OTHER ANTISEPTICS.—W. F. von Oettingen and others describe experiments which indicate that mercurochrome, when once fixed on the surface of the tissue, develops no bacteriostatic action in contact with bacterial cultures. It penetrates only into the dead or dying mucous membranes of different organs, such as bladder, vagina and digestive tract, and it may diffuse through the cornea when in contact for a sufficient period. It does not penetrate the living skin but is fixed in the most superficial layers of the epithelium, and it does not penetrate or stain normal muscular tissue. It penetrates necrotic and dead tissue and stains them deeply and permanently. The tissue toxicity of mercurochrome is relatively low, but the 5 per cent aqueous solution is distinctly injurious as judged by excised ciliated mucous membranes. The authors believe that mercurochrome cannot be relied on to destroy bacteria that have penetrated into the living tissue of a wound or of the skin; it could do no more

than disinfect the surface and the necrotic tissue. This limitation is shared more or less by all antiseptics so that no substance can be properly called a safe and certain wound antiseptic. No antiseptic takes the place of thorough cleansing and surgical treatment. When these are not practical, for "first aid" or for very superficial wounds, antiseptics are probably better than no treatment at all. The antiseptic efficiency of mercurochrome is not outstanding, and for skin disinfection the aqueous solution is distinctly inferior. The absence of irritation may be an advantage, especially with open wounds, and for prolonged treatment; but its limitations should always be borne in mind.—*J. Am. M. Ass.*, 1932, 99: 127.

If you desire to know a man's sentiments towards you, consult him upon something which interests you; his reply will reveal to you his whole heart, and whether he is your friend or your enemy.—Plato.

EXPERIENCES IN PULMONARY LOBECTOMY*

By NORMAN S. SHENSTONE AND ROBERT M. JANES,

Toronto

SAVE in its advanced stages, bronchiectasis was hardly known to our profession until the introduction of iodized oil and the x-ray method of diagnosis. Now, we detect many cases, obscure as to their history and lacking in symptoms and physical signs, which would certainly have gone unrecognized in the past. The increased number of these cases has afforded an opportunity of which the profession has taken full advantage, and a large amount of work has been done in the endeavour not only to discover the physical and bacterial causes of the disease but also to find methods for its cure and amelioration. Notwithstanding this, there is still considerable uncertainty as to its etiology and the factors that determine the character and extent of its progress, nor is there as yet a sufficient literature on the subject to guide those of us who in ordinary practice would see very little of the disease. This very ignorance of the condition is perhaps some excuse for the work we have been doing during the past three years, as it is obvious that no true judgment can be made of the value of any form of treatment until all reasonable varieties of therapy have been explored.

The material that forms the basis of this paper represents our experience with 15 cases in which one or more lobes of the lung have been removed for bronchiectasis. Lest we be criticized as advocating this somewhat radical procedure as the proper form of treatment of all types of that disease, we hasten to state that each of these cases had been for a considerable period under the care of expert physicians, and that all the simpler forms of treatment had been tried without sufficient benefit to warrant their continuance. In addition, each was made the subject of careful study by one of our medical confrères at the Toronto General Hospital,

and no operation was undertaken without his personal recommendation. Further, no case was considered suitable for transfer to the surgical wards until lipiodol injections had, as far as possible, excluded bilateral or multilobar disease. That we found on two occasions an invasion of other areas unrecognized before operation was due to faulty reading of the films, and was very apparent after the event. These were cases in which the lipiodol shadows in the lower tongue-like process of the left upper lobe overlaid and were considered part of the lower lobe. In one of these cases, unfortunately, the diseased tissue was left behind; in the other case it was recognized and removed.

Our choice of lobectomy as against some less serious operation was based on the feeling that other methods offered less expectancy of cure and, in the not improbable event of their failure, precluded the possibility of any more radical procedure. We undertook our first case three years ago, devising for it a two-stage operation, an operation which we now know was poorly conceived and as poorly executed. The removal of the lobe was performed six weeks after a wide lower thoracoplasty. Very dense adhesions were encountered and the excision of the lobe (right lower) was attended by considerable hæmorrhage and shock. Only a rapid and inadequate closure of both the pedicle and wound was possible, the patient dying five days later from septic pleurisy and pneumonia. The difficulty and result of this experience made one feel that a two-stage operation gave too little hope of a successful issue to warrant further work in this direction, and we think we should probably have lost our interest in this problem had not Dr. Harold Brunn's paper on "Surgical Principles Underlying One-stage Lobectomy" come under our notice.¹ In that paper was enunciated the principle that the post-operative prevention of pneumothorax and hydrothorax by closed tube drainage reduced the area of pleural surface exposed to infection, and produced a long, easily closed channel into which the subsequent fistula would open. His

* Read before the conjoined meeting of the British Medical Association and the Canadian Medical Association at Winnipeg, August 27, 1930, with the addition of further cases operated upon in 1931.

From the Toronto General Hospital and the Department of Surgery, University of Toronto.

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results, one death only in six cases operated upon, were very much better than any others that had been published, and in the work we have done we have followed, with some considerable modification, the technique he describes.

PRE-OPERATIVE MEASURES

In each of our cases the diaphragm was paralyzed a few days before the major operation was undertaken; in 14 of these the phrenic nerve was crushed only and in one partially resected.

In our immediate preparation for the lobectomy on the day of operation the patient is allowed an early, light breakfast, the operating hour being deferred until the late morning, to give him ample time by cough and posture to obtain the maximum drainage from the affected lung. In our experience there is no one thing during the operation that disturbs the patient and the operator so much as the flooding of the sound lung by the secretions from the diseased side, and we believe that the 3 cases of pneumonia that developed post-operatively were probably due to this cause. The collapse of the affected lobe and the manipulation required during its removal must always express some of its purulent content into the trachea. If this be small in amount it appears to do no damage. When, however, it is profuse in quantity it invariably excites cough and dyspnoea and the success of the operation is jeopardized. We have had little experience with a pre-operative pneumothorax as a preventive of this complication, nor have we explored the possibilities of aspiration and lavage of the cavities through the bronchoscope. The former is, on account of adhesions, not infrequently impossible, and the latter could be used immediately before operation only if the patient had become thoroughly accustomed to the procedure. Yet we feel that one or other of these two preparatory measures should be employed when the disease is extensive and the discharge profuse.

In our earlier cases the operations were performed under intercostal block, with additional nitrous oxide toward the close if the procedure was prolonged. More recently the work has been done under spinal anaesthesia, using between 200 and 300 mgrm. of novocaine dissolved in 10 to 12 c.c. of aspirated spinal fluid. This method has proved very satisfactory and in no case has any general anaesthetic been required.

OPERATION

The operative technique employed in our cases follows. A long incision is made in the general direction of the ribs, passing just below the scapula and extending from a point a few inches above and behind the angle of that bone to the costal cartilages in front. The underlying muscles are severed in the same direction exposing the ribs and intercostal spaces. We have usually chosen the sixth interspace as our portal of entry into the chest, though the fifth or seventh appear to be equally satisfactory. The subsequent exposure is much enlarged by dividing the ribs adjacent to the selected interspace as near their vertebral ends as possible, and this we have done in each case before entering the thorax. For this purpose the lateral margin of the erector spinæ is dissected medially, and the tips of a straight bone-cutting forceps inserted close to the rib, which is severed without prior elevation of the periosteum. The intercostal muscles are then carefully divided, and a small puncture is made in the pleura through which air is allowed to enter very slowly by plugging the opening intermittently with the tip of the finger. If, following Brunn's suggestion, the patient be impressed both before and during operation with the importance of avoiding cough, almost no disturbance of pulse or respiration results from this procedure. When the lung has retracted, the intercostals with the underlying pleura may be divided safely from the costal cartilage to the angle of the ribs and the wound spread widely with self-retaining retractors. An enormous exposure is obtained in this way, giving easy access to the underlying structures. Adhesions are variable; in our experience they are always present in the interlobar fissure and usually so between the lower lobe and the diaphragm. In several of our cases the pleural space was obliterated. Adhesions are separated by a combination of sharp and blunt dissection and great care must be taken to avoid wounding the lung.

When the diseased lobe has been freed completely, a snare of heavy cord is passed around it as near as possible to the mediastinum and the loop drawn tight in the instrument designed for the purpose (see Fig. 8). We believe it to be a better method of controlling the pedicle than any other we have seen described, and nothing has given us such a feeling of comfort

and safety in this operation as this simple device. Without devitalization of the tissue, it controls the blood supply, obstructs the bronchi, provides a solid support during the suture of the pedicle and in addition can be used in limiting medi-

astinal movement during the operation. For the purpose of preventing the escape of infected material during the section of the lung, a second snare is placed about one and a half inches distal to the first. The general pleural cavity

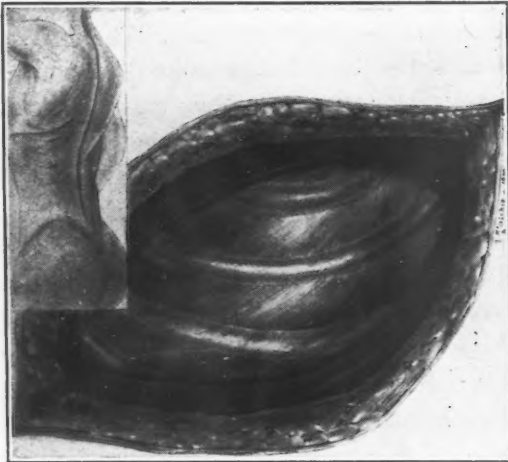


FIG. 1.—Incision and exposure of the chest wall.

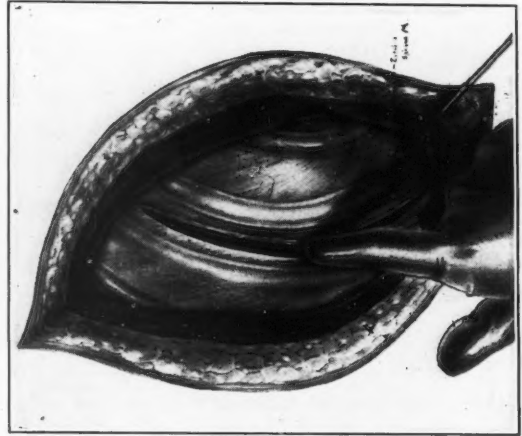


FIG. 2.—Incision in intercostals and method of allowing air to enter slowly (Brunn): note the retraction of the erector spinæ for division of the adjacent ribs.

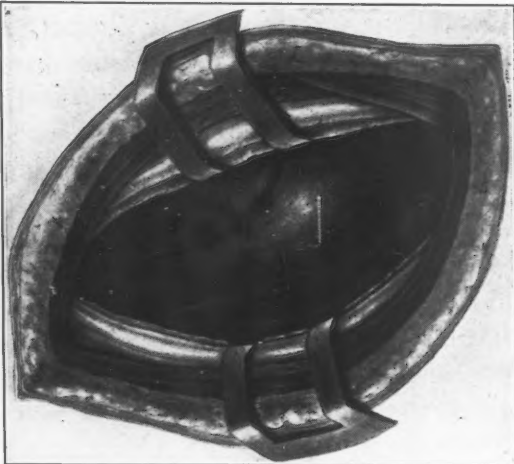


FIG. 3.—Exposure of underlying structures by retraction of ribs.

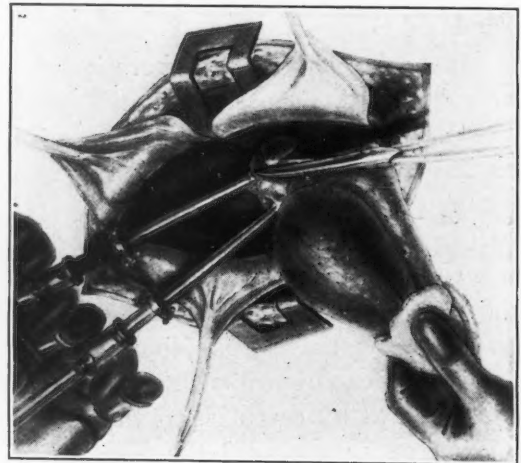


FIG. 4.—Two snares *in situ*, with beginning amputation of lobe.

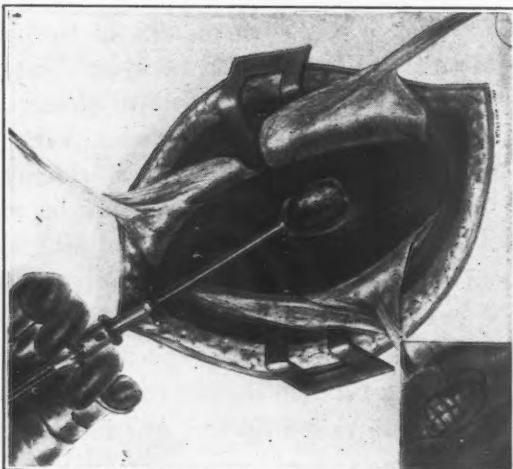


FIG. 5.—Pedicle after amputation of lung, illustrating the method of suture.

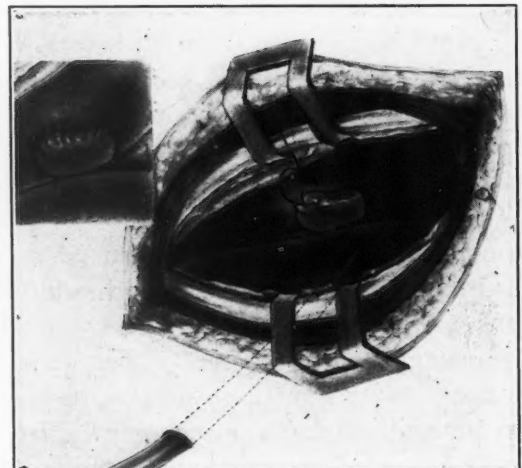


FIG. 6.—Suture of the closed pedicle to the surface of adjacent lobe, showing also the drainage tube in position.

is then protected by moist packs and the lobe cut away, leaving a pedicle three-quarters of an inch in length. The section is best accomplished with curved scissors, and the cut surface of the pedicle should be somewhat excavated to assist in the subsequent closure. Frequently, one or

catgut suture inserted into the summit of the diaphragm.

The wound is closed in layers. Interrupted chromicized catgut sutures enclosing the adjacent ribs bring the edges of the long rent in the intercostals easily and accurately together.

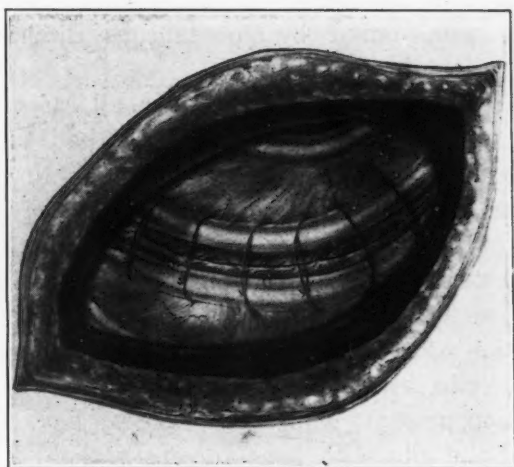


FIG. 7.—Method of closure of the intercostal incision.

more bronchi project above the surface; these should be trimmed away and the resultant bare area painted with acriflavine (1-1000). Obvious vessels are caught with forceps and ligated and a running suture of chromicized catgut is introduced across the pedicle but not including its pleural margin. The snare is then slightly released and any oozing areas can be included in the suture before it is tied. A further running catgut stitch closes over the pleural margins, an endeavour being made to invert the edges in the process. The snare is then removed and the stump sutured to the under surface of the upper lobe. Packs are removed and the remaining lobe carefully examined for any small tears overlooked earlier.

A small incision is then made in the ninth interspace in front of the mid-axillary line through which the end of a long tube of about 32 F. calibre is drawn. The fenestrated end of this tube is placed about one inch away from the pedicle of the resected lung and maintained in place by a plain

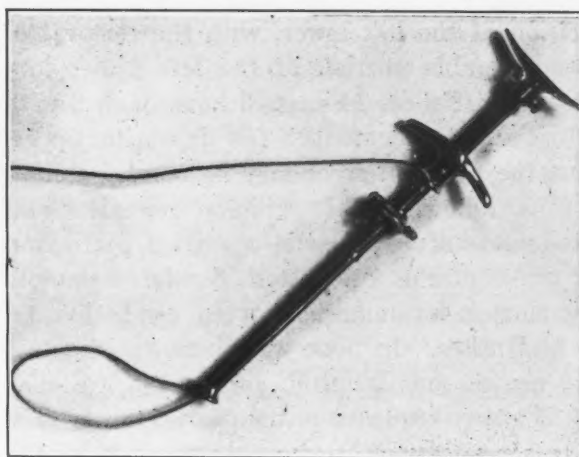


FIG. 8.—Modification of the tonsillar snare devised for securing the pedicle during the amputation of the lobe.

In our experience the inclusion of the nerves has not caused any lasting pressure neuritis. The muscles are approximated by a continuous suture of chromicized catgut, and the skin by an ordinary running dermal suture.

As soon as the pleura is closed, the distal end of the drainage tube is placed under the surface of a mildly antiseptic solution contained in a bottle, maintained at least two feet below the level of the chest. The patient is then asked to cough. This act expresses the air from the pleural cavity, permits of the rapid expansion of the lung and prevents mediastinal flapping. At the end of twenty-four hours it has been our custom to attach a continuous siphon drainage to this tube

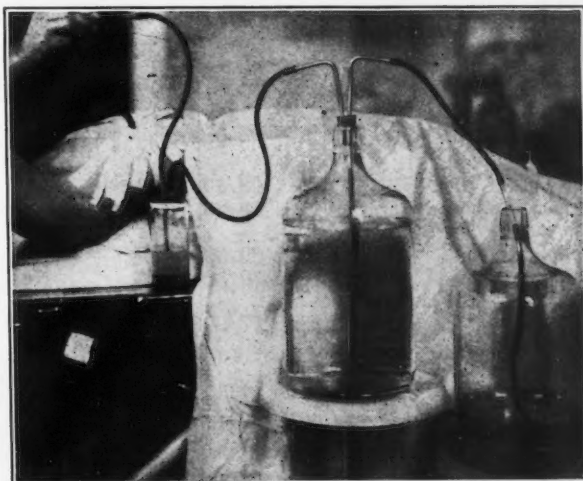


FIG. 9.—Apparatus used in securing continuous suction drainage.

using a column of about eighteen inches of water. Its use is continued until the tube is withdrawn or a fistula develops.

During the first few days, post-operatively, there is a profuse serous or serosanguineous discharge which rapidly lessens, so that, unless a

fistula forms, there is almost no drainage at the end of a fortnight.

The extent of the surgical work performed on the 14 cases operated upon in one stage is as follows: 9 cases of excision of the lower lobe only; 3 cases of excision of the right middle and lower lobes at the same time; and 2 cases of excision of the left lower, with the removal of a considerable portion of the left upper lobe as well. Of these 14 cases 3 have died, 2 with diffuse septic pneumonia a few days after operation; the third, of secondary hæmorrhage eight months following the primary resection and three weeks after a plastic operation performed for the closure of a persistent fistula. Complete post-mortem examinations were conducted on all fatal cases. In none was there the slightest evidence of mediastinitis, and we believe that this is a rare sequence to the operation.

Of complications, the most serious has been septic pneumonia. In one case (No. 14) there was a well marked massive collapse of the lower lobe on the sound side, which persisted for some weeks and resulted in a moderate degree of bronchiectasis not present before operation. In

several cases a diffuse bronchitis occurred. In two cases, empyema developed in the upper pleura; of these, one cleared up quickly under simple intercostal drainage; the other required extensive plastic operation for its closure. There were also two cases of probable empyema, localized in the region of the pedicle, both of which were cured by spontaneous discharge through the bronchus.

Primary union was obtained in all cases except two; in these mural abscesses had to be drained. In our first successful case (No. 2) a sinus developed in the vertebral end of the scar two months after operation and x-ray demonstrated an osteomyelitis of both ribs. This, we believe, was due to the fact that the elevation of the periosteum before the division of the ribs had made them vulnerable to the infection present. Since this time we have sectioned the ribs with bone forceps without first elevating the periosteal covering. By this method time has been saved, and no osteomyelitis has occurred; in addition we have felt that the contour of the chest was better preserved.

In the whole series of 15 cases 5 developed

TABLE

Case	Age	Admission	Date of Operation	Extent of Operation	Discharge	Post-Operative Days in Hospital	Temporary Fistula	Complications	Result
<i>Two-Stage Lobectomy:</i>									
1. M.S., female	34	May 22/28	Jan. 22/29 Mar. 6/29	R.L.	Mar. 11/29	5	No	B. Pneumoniæ	Died
<i>One-Stage Lobectomies:</i>									
2. M.R., female	19	May 3/29	May 4/29	R.L. and R.M.	June 9/29	36	Yes	Osteomyelitis, Rib	Cured
3. A.D., male	47	Nov. 24/29	Nov. 30/29	L.L.	Dec. 23/29	23	No		Cured
4. C.C., female	20	Aug. 20/29	Dec. 18/29	R.L. and R.M.	Dec. 23/29	5	Yes	B. Pneumoniæ	Died
5. R.L., female	26	Nov. 5/29	Feb. 21/30	L.L.	May 29/30	99	No	B. Pneumoniæ	Improved
6. V.W., female	23	Feb. 17/30	Mar. 26/30	L.L. and part L.U.	June 30/30	96	No	Empyema (U) Drainage	Cured
7. J.S., male	30	Feb. 12/30 June 30/30	July 2/30	L.L.	Apr. 17/30 Oct. 29/30	89	No	Empyema (U) Drainage and thoracoplasty	Un-improved
8. L.S., male	52	Aug. 31/30	Oct. 8/30	R.L.	Oct. 14/30	6	No	B. Pneumoniæ	Died
9. D.McG., female	14	Oct. 24/30	Nov. 1/30	L.L.	Dec. 17/30	46	No	Pleurisy and acute bronchitis	Improved
10. K.F., female	21	Jan. 21/31	Feb. 11/30	L.L.	May 5/31	83	No	Secondary infection wound	Cured
11. F.L., female	22	Jan. 28/31	Feb. 27/31	R.M. and R.L.	Oct. 30/31	245	Yes	Empyema and secondary hæmorrhage	Died
12. B.O'B., female	24	Mar. 25/31	Apr. 1/31	L.L.	June 18/31	78	No		Un-improved
13. M.K., female	20	July 28/31	Aug. 19/31	L.L. and part L.U.	Oct. 1/31	43	No		Cured
14. M.C.S., female	30	Aug. 14/31	Aug. 19/31	L.L.	Oct. 31/31	63	No	Massive collapse of right lower lobe	Improved
15. G.H., female	32	Nov. 23/31	Dec. 9/31	L.L.	Jan. 21/32	43	Yes		Cured

fistulae, but in the 12 in which our technique in dealing with the pedicle was used only two fistulae occurred. Except in one case (No. 11) all fistulae were of very short duration. Of interest is the fact that in our ten operations on the left lung we have had no fatal result and only one fistula.

The pathological studies were the work of Dr. W. L. Robinson, while the bacterial examinations were conducted by Dr. P. H. Greey, under the direction of the Professor of Pathology. In almost all the cases, immediately following the excision of the lobe, the specimen was taken, under sterile conditions, to the Pathological Department for thorough study of the bacterial content. Only in those cases in which immediate examination was made have the bacterial findings been noted.

Limitations of space render it impossible to give a history of all the cases operated upon, but those following are illustrative of the major complications encountered.

CASE 2

M. R., a female, aged nineteen, first admitted to the Toronto General Hospital on October 16, 1926, with a three years' history of recurring and persistent winter colds. The condition had been much worse during the few weeks before admission and the sputum had become blood-stained, much more profuse in quantity (eight ounces daily), and foul in odour. The condition had culminated in a severe hæmorrhage. She improved under rest and postural drainage, but there was little change in the character and amount of expectoration on the date of her discharge, March 12, 1927.

During the subsequent two years the patient remained at home with alternating aggravation and recession of acute pulmonary symptoms, but always with a profuse foul expectoration which excluded her from all social life, and made it impossible for her to obtain employment.

She was readmitted to hospital on May 3, 1929, and the right middle and lower lobes were excised on the following day. The chest was opened through the fifth interspace, the vertebral ends of the adjacent ribs being divided subperiosteally. Many and dense adhesions were encountered. Control of the pedicles was attempted by the introduction of interlocking sutures, but was not completely successful. Considerable blood was lost in the procedure. A hurried suture of the pedicles and of the original wound only was possible. Closed tube drainage was established through intercostal puncture. She had rather a stormy convalescence, a fistula opening on the seventh day. X-ray taken shortly after operation disclosed the fact that the upper lobe was drawn downward, leaving a hydropneumothorax occupying the upper half of the pleural cavity. This did not become infected and there was gradual obliteration of the space by the expanding lung. The patient was discharged on June 7, 1929, healed, except for the fistula which closed some three weeks later. She subsequently developed a sinus in the vertebral end of the scar and was readmitted to the hospital on October 13, 1929, for the removal of sequestra following osteomyelitis of the fifth and sixth ribs.

The patient, a social leper before her operation, is now quite well and employed in a gainful occupation. There is no sputum.

Pathologist's report.—"The specimen consists of two lobes of the lung, one measuring 8 x 6 x 2 cm., the other 16 x 14 x 3 cm. The tissue is dark red in colour, soft and flabby in feel. The bronchi are widely dilated, thick-walled, and contain blood stained muco-pus. Microscopically, fibrosis is widespread and there is marked infiltration with lymphocytes, endothelial and plasma cells."

CASE 6

V. W., a female, aged twenty-three, housewife, was admitted to the medical wards of the Toronto General Hospital on February 17, 1930. She stated that she had been perfectly well until November 1, 1929, when she developed a dry, hacking cough with slight expectoration. This was followed a few weeks later by the symptoms of an acute pleurisy (left) with which she was confined to bed for several days. Since the onset there had been a loss of twenty-five pounds in weight with progressive weakness and dyspnoea. The sputum at the time of admission to hospital was only one-half ounce daily and was not foul in odour. Examination of the chest revealed impaired resonance, decreased movement, increased vocal resonance, tubular breathing, and many fine and medium moist râles, increased on coughing, over the left lower lobe posteriorly and below the fourth rib anteriorly. X-ray, following lipiodol injection, showed a very marked bronchiectasis involving the left lower lobe. The lower lobe was apparently collapsed and lying behind the heart.

The left phrenic nerve was divided on March 22nd, and four days later the left lower and a portion of the lower part of the upper lobe were removed. There were no adhesions. The lower lobe was completely collapsed, dark in colour, and had a meaty feel. The lower one and a half inches of the lingual portion of the upper lobe showed similar changes. It was removed in the following way. Two pairs of strong forceps were placed across the lung immediately above the collapsed portion and the intervening tissue divided with a scalpel. Using a swaged needle a running suture of tanned catgut was passed about the remaining forceps, the forceps removed, the suture pulled taut and then carried back in Lembert fashion over the first layer. The stitches held well and there was only a trifling and temporary leakage of air. On the third day following operation the temperature reached 103° and the pulse rate 140. On April 5th, 400 c.c. of turbid, yellow fluid were aspirated from the left chest at a point above the main incision and on April 7th, 300 c.c. of thicker pus. X-ray showed that the upper lobe had been drawn down to the diaphragm, leaving an infected pneumothorax occupying the upper pleura. On April 9th, an intercostal drainage of the empyema was done, following which her condition improved rapidly. On the day following the lobectomy 200 c.c. of serosanguineous fluid drained from the original intercostal opening; the amount gradually lessened, to cease on April 5th, following which the tube was removed and the opening allowed to close. The sputum averaged from four to six ounces for the first week, then gradually decreased to one ounce on May 4th and finally ceased. When discharged from hospital on June 20th, the wounds were all healed, she had no cough and no sputum, and was feeling well. The original wound had healed by primary union. She has remained quite well.

Pathologist's report.—"The gross specimen consists of a wedged-shaped soft rubbery lobe of lung measuring 14 x 9.5 x 2 cm. and a much smaller piece of upper lobe. The bronchi are thick walled and dilated to within 2 mm. of the pleural surfaces. When the bronchial mucosa of the freshly removed specimen was examined under the microscope the cilia could be seen to be in active motion. Microscopic examination shows the lumina of many of the bronchi almost completely filled with a

fibrino-purulent exudate. The mucosa lining of the bronchi is for the most part heaped up and redundant, but occasional small areas of ulceration are noted. The cilia of the mucosal epithelium can be easily identified in the stained preparation. Immediately beneath the epithelium there is a fairly broad zone of lymphocytic and occasional eosinophilic infiltration, in which numerous congested capillaries were seen. More peripherally there is well established fibrosis. The cartilaginous flakes are imbedded in unusually dense fibrous tissue and show some slight degenerative changes and some irregularity in their cellular arrangement. Lying between zones of peribronchial fibrosis are islands of collapsed pulmonary tissue, the alveoli of which are lined with a continuous layer of cuboidal epithelium. Elsewhere the peribronchial fibrosis passes gradually into areas of fibrosis showing remnants of alveoli. The blood vessels are all thick-walled."

Bacteriologist's report.—"Smears showed Gram-positive cocci in chains and a few fusiform bacilli. A few spirochaetes were seen in the dark field, and in tissue sections they were seen lying beneath the bronchial mucosa. The cultures gave *S. haemolyticus* and *B. fusiformis*."

CASE 8

L. S., a male, aged fifty-two, Italian, bricklayer, was admitted to the Toronto General Hospital on August 31, 1930; died October 14, 1930.

The patient gave a history of having been perfectly well until eighteen months before admission when he had an attack of pleurisy on the right side. Subsequently he suffered with epigastric discomfort which was considered peptic in origin, and he was placed in hospital for four weeks on diet. Some improvement resulted, but he remained weak and unable to work. At this time he developed a foul breath and a nasal discharge and on July 4, 1929, a submucous resection was done under general anaesthesia. This was followed by an acute broncho-pneumonia with which he remained in hospital three weeks. Subsequently he developed a cough which gradually became more frequent and productive. In March, 1930, he had a bout of fever with which he had to go to bed. The sputum increased in amount and became foul in odour. In June, 1930, following the obtaining of pus through an aspirating needle, and, with the diagnosis of abscess of the lung, a rib resection was performed. The lung was found to be non-adherent and was sutured to the parietes, a tube being introduced through an incision into the lung itself. Drainage appears to have been carried out for only four days and the patient was discharged from hospital a fortnight later. Since that time he had had irregular fever and suffered with great weakness and frequent night sweats. The sputum, amounting to twelve ounces daily, had been very foul and twice blood-stained.

The patient was a thin, rather pale man. On examination, there was markedly diminished respiratory movement of the right chest. Below the eighth rib on this side the chest was flat on percussion and absence of vocal fremitus and breath sounds was noticed. Above the eighth rib resonance was impaired and breath sounds distant. A few râles were heard over this area, as also over the left base posteriorly. Lipiodol showed a well marked bronchiectasis limited to the right lower lobe. There was no improvement in his condition with postural drainage. His temperature had a daily range of 100° to 102°, while his pulse varied between 70 and 120.

On October 1, 1930, the right phrenic nerve was crushed, and on October 8th the right lower lobe was resected under spinal anaesthesia (novocaine mgrm. 200 dissolved in 10 c.c. of withdrawn spinal fluid). The chest was opened in the sixth interspace. The lower and middle lobes and the lower portion of the upper lobe were bound to the chest wall by very dense adhesions which were separated with great difficulty, and with considerable bleeding, requiring oversewing in a number

of places. The lung was excised in the usual way and the closure carried out as described. The operation was prolonged to two hours, the pulse rising during that time from 100 to 160, and the blood pressure dropping from 140/70 to 70/40. A transfusion of 600 c.c. was given at the end.

His post-operative course at first appeared satisfactory; the pulse did not rise above 130 and the temperature above 101 degrees until the fourth day, when coarse râles appeared over the whole chest and the temperature, pulse and respirations rose. He died on the sixth day.

Autopsy performed seven hours after death showed an acute broncho-pneumonia and purulent bronchitis. There was no mediastinitis and no fistula had developed. The pleural cavity had been obliterated, except for the channel in which the drainage tube lay.

Pathologist's report.—"The gross specimen consists of the right lower lobe of lung, measuring over all 15 by 10 by 5 cm. The external surface is red in colour, and covered with numerous fibrous tags. The bronchi were very carefully dissected out and are seen to be dilated, more particularly at the distal ends, and contain a moderate amount of rather thick, pinkish gray exudate. The mucosal lining is pinkish gray in colour and soft and velvety in appearance. Microscopically, the mucosa is lined with a stratified layer of columnar ciliated epithelium and diffusely infiltrated with lymphocytes and plasma cells. Degenerative changes are seen in the cartilage plates, and the surrounding lung substance shows a chronic inflammatory condition with fibrosis."

Bacteriologist's report.—"Bacteria were not seen in stained smears or in tissue sections. The culture was *S. non-haemolyticus*."

CASE 12

B. O'B., a female, aged twenty-four, was admitted to the Toronto General Hospital on March 25, 1931, and discharged on June 18, 1931. The patient stated that she had been perfectly well until two and a half years before when she had had an hæmoptysis of about four ounces. This was repeated several times in the following weeks. Since that time there had been a persistent cough with expectoration, very slight at first, but gradually increasing in quantity. A year and a half ago she had "pleuro-pneumonia" and following this there was definite increase in the amount of sputum. One year ago she had severe pain in the left chest and was in bed for six weeks. During this time the sputum became foul and a diagnosis of abscess of the lung was made. At the time of her admission she had a daily expectoration of about one and a half ounces of purulent material, for the most part brought up in the evening. She had lost about twenty-five pounds in the past two years.

On examination, there was diminished respiratory movement of the left chest, with slight impairment of resonance, and fine and medium crackling râles from the scapula to the base posteriorly. Lipiodol injection showed bronchiectasis of the left lower lobe.

On March 26, 1931, the left phrenic nerve was crushed and on April 1st, under spinal anaesthesia, the chest was explored through the sixth interspace. The pleural cavity was completely obliterated by moderately firm adhesions which were divided by sharp and blunt dissection, finally mobilizing the lower lobe, which, apart from the thickened visceral pleura, showed very little gross evidence of disease. The lobe was removed in the usual way. Adhesions of the upper lobe were not disturbed. Despite the prolonged operation, the patient's condition remained good throughout, there being very little change in either blood-pressure or pulse rate. She was given a blood transfusion of 200 c.c. at the close.

The immediate post-operative reaction was very slight, the temperature reaching a maximum of 101° and the pulse 120 during the first week. Drainage amounted to eight ounces on the first day, fifteen ounces on the second, and never more than two ounces a day until the

sixth, when it ceased. The tube was removed on April 11th, a small tube replacing it for a few days. Beginning with the seventh day there was a slow rise in temperature, which reached 103° on April 12th, when the patient expectorated a cupful of dark, foul-smelling pus. During the following days, but in slowly diminishing quantities, she continued to bring up purulent material. This gradually became watery in character and amounted to about one ounce at the time of her discharge. We considered that a collection of pus in immediate relationship to the stump of the resected lobe was the probable source of the purulent expectoration, though we could not demonstrate this by x-ray, as was possible in another of our cases in which a very similar clinical picture occurred.

This patient did only fairly well after discharge. There remained a somewhat irritating cough, and about half an ounce of sputum, which in February, 1932, was slightly tinged with blood. There has been no gain in weight and from time to time she has suffered pain in the right chest. On examination in February, 1932, she presented evidence of bronchiectasis in the right lower lobe. The result must be considered a failure.

Pathologist's report.—"The gross specimen consists of a lobe of lung, measuring 15 x 11 x 3 cm. The external surface is pinkish red in colour, shaggy in appearance. On opening a number of the bronchi they are seen to be quite dilated and have a glistening, moist, smooth, greyish pink appearance. Microscopically, sections show the bronchi to vary in degree of dilatation. They are lined with stratified columnar epithelium which is quite hyperplastic. The underlying tissues are diffusely infiltrated with lymphocytes and a few plasma cells. The bronchial arteries show varying degrees of endarteritis and in some cases the lumen is nearly occluded. There is fibrosis and collapse of the adjacent lung tissue. In the wall of the bronchi some areas show complete disappearance of the muscle coat while in other areas there is only partial disappearance. No areas of ulceration can be detected on the mucosal surface of the bronchi."

Bacteriologist's report.—"Smears showed a few Gram-positive cocci in pairs and numerous fusiform bacilli. Large numbers of spirochaetes were seen in the dark field, but could not be demonstrated in tissue sections. The culture was *S. viridans* (alpha prime)."

CASE 14

M. C. S., a female, aged thirty, a school-teacher, was admitted to the surgical wards of the Toronto General Hospital on August 14, 1931, and discharged October 21, 1931. The patient had had a cough with considerable sputum since early childhood. At the age of twenty-five her tonsils had been removed and her maxillary sinuses drained, with marked improvement in her condition, which remained good until April 12, 1931, when she developed a pleurisy on the left side. Since that date she had remained in bed, having had two attacks of pneumonia (said to have been bilateral) during this period.

The patient was a rather thin girl and presented on physical examination no evidence of her disease, except for diminution of respiratory movement in the left chest and the presence of a few râles at the base posteriorly. X-ray, however, disclosed a well marked bronchiectasis, apparently limited to the left lower lobe.

On August 15, 1931, the left phrenic nerve was crushed and four days later, with a pre-operative sedative of nembutal, three grains, the left lower lobe was removed under spinal anaesthesia (250 mgrm. in 8 c.c.). The pleura was opened through the sixth interspace. The lower lobe was adherent to the chest wall throughout,

very firmly in the costo-phrenic sinus, and loosely to the dome of the diaphragm. These adhesions were freed and the excision performed as usual. Further adhesions of the lower portion of the upper lobe to the chest wall were also separated, to permit the expansion and descent of this lobe. Drainage was established through the eighth interspace. The time of operation was forty-five minutes. The pulse, at the beginning 100, rose to 150; the blood pressure, 130/80 at the start, was 120/90 at the close.

On the following day, August 20th, there were many bubbling râles in both lungs. Drainage was twenty ounces. She was given a transfusion of 500 c.c. On August 22nd, there was well marked dullness at the right base posteriorly with many moist râles. Two days later there was definite consolidation over this area, a condition that persisted for several days, an x-ray taken on September 16th showing the triangular shadow of a massive collapse of the right lower lobe. This was verified on October 9th, when an injection with lipiodol showed a limitation of the collapse to that lobe and a definite tubular bronchiectasis. Lipiodol, repeated on October 22nd, showed no evidence of bronchial dilatation. During the fortnight following operation the temperature range was between 100° and 102° and the pulse 80 to 100. There was no drainage after the second day and the siphon was discontinued on the sixth, the tube being removed a few days later. No fistula developed at any time. Sputum at the time of discharge amounted to less than 5 c.c. daily.

Since discharge there has been an increase in weight of ten pounds and her general condition is improved. There is, however, a persisting cough with small amount of muco-purulent expectoration.

Pathologist's report.—"The gross specimen consists of a lobe measuring 14 x 11 x 3 cm. The external surface is dark red, hæmorrhagic, with numerous fibrous adhesions. The lobe is soft and flabby in consistency with a number of ropy masses palpable towards the base. On section the bronchi are markedly dilated, the dilatation extending to within 1 cm. of the lung periphery. It is cylindrical for the most part with a few saccular outpouchings. The bronchial walls are slightly thickened. The mucosa is velvety and covered with small amounts of hæmorrhagic muco-purulent secretion. Microscopically, blocks taken from various portions of the bronchial tree show the following features. The epithelial lining throughout is columnar and ciliated and intact. The submucous tissues show very extensive chronic inflammatory reaction, characterized by a granulation type of tissue infiltrated diffusely with lymphocytes and plasma cells. The capillaries of the granulation tissue stand out prominently. The bronchial musculature is wanting in many areas being replaced by the granulation tissue. With Weigert's elastic tissue stain considerable fragmentation of the elastic laminae is seen. The underlying cartilage plates in many areas show partial organization. Involvement of the surrounding lung tissue is somewhat variable. In some areas it is wanting, and in other areas there is a chronic interstitial type of pneumonia with fibrous thickening of the alveolar walls and diffuse areas of fibrosis, all being infiltrated with lymphocytes and plasma cells. The bronchial arteries show slight thickening of their intima."

Bacteriologist's report.—"Dark field preparations were negative for spirochaetes. Stained smears showed Gram-positive cocci in pairs and short chains, and a few delicate Gram-negative bacilli. Fusiform bacilli were not seen. Culture showed *Staph. albus* and *B. influenzae*.

REFERENCE

1. BRUNN, *Arch. Surg.*, 1929, 180: 490.

SIMPLE GOITRE

THE INCIDENCE OF THYROID ENLARGEMENT IN WINNIPEG SCHOOL CHILDREN

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PART II*

THE MATERIAL USED

IN the present investigation the author has endeavoured to cover practically all factors which might affect the pathology of the thyroid gland, with the exception of hours of sleep and play. The survey covers all school children attending grade and high schools in Winnipeg. All children herein reported were examined under the auspices of the Winnipeg School Board. The routine examination of all children is made about every second year, special attention being paid to septic tonsils, diseased teeth, thyroid enlargement, cervical adenitis, nutritional disturbances, and heart and lung diseases. In addition, special examinations are made from time to time of cases reported by the school nurses.

For the past five years, following Hamilton's survey,¹ goitre has been studied more assiduously by the profession at large. It has become a matter of public health. Thyroid clinics also have been established, and as a result children are more carefully checked over and a higher percentage have had treatment.

CLASSIFICATION OF THYROID ENLARGEMENT

Before it is possible to state the percentage incidence of thyroid enlargement, it is necessary to have a standard of classification. For this I have adopted Marine's original classification, glands being graded as normal, slight, medium or large.

Normal.—(a) Not visible as a bulging across the trachea. (b) The isthmus can barely be detected across the trachea. (c) The lobes are either not palpable or barely palpable.

Slight.—(a) Visible bulging of the isthmus over the trachea. (b) A wide band of tissue extending across the trachea. (c) Readily palpable lateral lobes.

Medium.—Those with moderately large palpable lateral lobes and a well marked isthmus.

Large.—Those with large palpable lateral lobes and a well marked isthmus.

It is very interesting to watch the different methods used in examining a thyroid gland. It is essential, not only in surveys of this nature but also in private practice, to have a correct method of estimating the size and consistency of a thyroid gland. To have any idea of the actual size of a thyroid lobe one must actually palpate the lobe between one's fingers and thumb. This can only be done by using a very definite technique. The best method is for the examiner to face his patient, preferably standing up. To palpate the right lobe he must place his right hand on the left shoulder, palm downward, and with the thumb gently applied against the left lateral wall of the trachea. Displace this structure together with the thyroid over to the right side. The examiner next places the finger of his left hand on the right side of the neck behind the posterior border of the sterno-mastoid muscle. The thumb naturally falls in front of the anterior border. In this way the finger and thumb surround the sterno-mastoid, and the right lobe of the thyroid is very easily picked up, lying just postero-medial to it. It is now an easy matter to define its outline, whether smooth or nodular, and to determine whether it is firm and granular, or soft and elastic. In some cases tenderness will be elicited. Normally, on asking the patient to swallow, the finger and thumb can be made to meet below the lower pole and one can in this way fix the thyroid high in the neck. After a short experience one becomes quite accurate in measuring the length, width and breadth by simple palpation. To palpate the left lobe, one simply reverses the process. Any failure to cover all the above mentioned points is liable to lead to faulty conclusions.

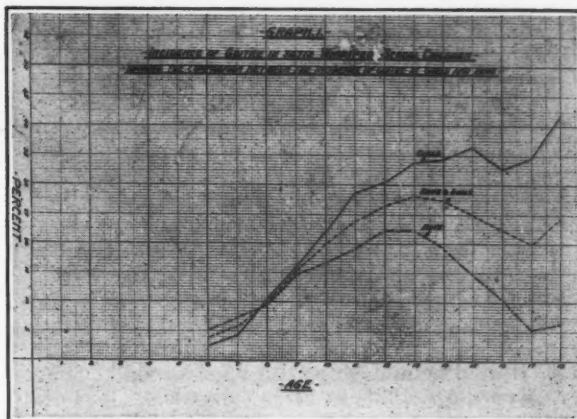
* Part I of this research can be found in the *Journal*, 1932, 27: 8.

No attempt has been made to keep a separate note on all glands containing adenomatous nodules. In my experience these are moderately rare, yet they do occur. I have one child, now ten years of age, in my own private practice, who has had a well defined adenoma in her right lower pole since six years of age.

In spite of the use of Marine's classification it is still a matter of individual judgment as to "when is a thyroid gland enlarged?" It is quite true that a normal functioning gland in a Winnipeg school girl may be larger than the gland of a Toronto school girl of the same age, weight, etc. Hunziker states that the size of the normal thyroid is not known. Hertzler believes that the normal thyroid is just palpable to experienced hands, while Cabot states it can rarely be felt. It is therefore evident that, in our series of cases, glands must be classified in an arbitrary fashion. Borderline cases such as are classified as "slight" in this series, in the judgment of another practitioner might be classified as normal. I fully realize that these might be classified as simply physiologically enlarged or normal glands. It seems to me however, that these are at least in the pre-thyroid-enlargement state and require attention. In a survey in Michigan this group was classified as normal. Only glands visibly enlarged were counted. Even after eliminating this group in the Michigan survey, 53.8 per cent of thyroid glands in girls were enlarged. This visual method of classification is very fallacious. Much depends on the architectural structure of the child's neck. Often one finds a very large gland, lying deeply placed under the prominent and heavy sterno-mastoid muscles, which is quite invisible on inspection. Moreover, the thyroid surgeon knows that so often at operation he finds a gland much larger than he expected. This is often due to a large part of the gland being substernal or intra-thoracic. As a result of this we are forced to conclude that actual palpation between thumb and finger, as stated by Plummer, is the only exact way of estimating thyroid enlargement.

Graph I shows the incidence of thyroid enlargement in (a) 15,176 girls, (b) 15,525 boys, (c) a composite graph of 30,701 boys and girls. It will be seen that thyroid enlargement in children 6 years of age is under 5 per cent. It gradually rises until at 12 it reaches 30 per

cent in girls and 22 per cent in boys. At this point the incidence changes. The enlargement in girls continues until at 15 the incidence is 36 per cent; in boys it has decreased to 14.9 per cent. In girls of 18, it has reached 41.5 per cent, but this exceedingly high figure is based on a small number of children. The incidence in boys steadily decreases until it has reached 5 per cent at the age of 17.



One must naturally assume that the home conditions, food and general hygienic surroundings are equal in the two sexes. Up to 12 years of age the incidence curve for boys and girls is about equal, as one would expect to find in an endemic area. How then can one explain the variance in incidence after the age of twelve? One is forced to assume that, apparently at the onset of puberty, some metabolic or endocrine upset occurs which is much more profound in girls than boys. The onset of menstruation and its attending psychic influences no doubt have a profound effect.

A comparison with surveys by other men is interesting. In the majority of surveys found in the literature, exact methods of classification have not been used. This makes comparison of only relative value. In some however very precise methods were adopted. Cohen² made an interesting survey in New York in 1924, sponsored by the department of Physical Training and Educational Hygiene, Board of Education, New York City. He used Marine's classification. He omitted examining for tonsillar and tooth infection, but checked up menstrual function closely. In the series of 9,978 white girls in New York proper, 20.28 per cent had thyroid enlargement. Previous surveys, using less exact standards, had reported approximately 3 per cent enlargement.

TABLE I.

Authority	Location	Number Examined	Incidence in Percentage			Ages	Remarks
			Children	Girls	Boys		
*Marine and Kimball.....	Ohio, Akron	3,872	....	56.41	....	10 to 20	Precise standards.
*Olesen (<i>Cincinnati Pub. Health Rep.</i> , July, 1924).	Ohio, Cincinnati.	47,493	32.0	39.8	26.6	6 to 17	Greatest prevalence between 11 and 13 years: one frank case of exoph. goitre; three tentative cases.
Olin (<i>J. A. M. A.</i> , April 26, 1924, 82: 1328).	Michigan, 4 counties.	31,612	47.2	53.8	40.5	5 to 18	Liberal standards used: only visible glands included.
*Olesen and Clark (<i>Pub. Health Rep.</i> , Oct. 10, 1924).....	Minnesota.	4,061	57.9	71.0	40.9	5 to 23	Precise standards.
Foard (<i>Pub. Health Rep.</i> , September, 1924, 39: 2354).	Montana, 7 counties.	13,937	21.6	32.0	13.4	6 to 20	Liberal standards: only distinctly enlarged glands included.
*Wallace (<i>California and West. Med.</i> , 1924, 22: 431).	Utah.	69,256	42.7	54.3	30.0	5 to 20	Elementary and high schools: precise standards.
*Hall, Hotrickter and Mohr (<i>Endocrinology</i> , 1925, 9: 137).	Washington, Seattle.	3,160	39.3	43.4	35.5	6 to 15	Precise standards.
Palmer (<i>J.A.M.A.</i> , May 10, 1924, 82: 1568).	New York, Syracuse.	25,875	18.0	....	....	....	High school pupils, 20 per cent: grammar school pupils, 16 per cent.
*Olesen (<i>Pub. Health Rep.</i> , January, 1925, 40: 1).	Colorado, Denver.	9,656	27.3 (white) 26.3 (negro)	....	....	8 to 22	Precise standards.
*Klein (<i>München. med. Wchn-schr.</i> 1924-1925, 72: 1244).	Germany, Essen.	8,033	57.9	54.5	....	12 to 13	Precise standards:
*Abbott, A. C.....	Canada.	30,713	18.5	22.4	14.7	6 to 18	present survey.

One would naturally expect a low incidence here owing to the fact that New York, being situated on the sea coast, has a good amount of iodine in the air, a plentiful supply of sea food, and its water supply is rich in iodine (110 parts of iodine in 100 billion parts of water). Table I is interesting as it shows the incidence of thyroid enlargement found by other observers. Only in those marked with an asterisk were precise methods used.

Table II shows the total number of children examined for each year from 6 to 18 years. It is interesting to note that from 6 to 14 about the same number of children for each year are in attendance at school. Apparently at 15, children begin leaving school. Column 2, Table II, shows the number of children with goitre, and column 3 is the same expressed in percentage. Twenty-eight decimal one per cent of boys and girls combined at the age of 13 have goitre, thus representing the age when

TABLE II.

Age	Number of Children Examined	Number of Children with Goitre	Percentage of Children with Goitre
6	2,572	94	3.6
7	3,065	180	5.8
8	2,977	294	9.8
9	2,990	459	15.2
10	2,972	573	19.2
11	3,156	750	23.7
12	3,064	803	26.2
13	3,069	863	28.1
14	2,636	705	27.4
15	2,070	518	25.0
16	1,312	292	22.2
17	612	122	19.9
18	218	53	24.3

goitre is most prevalent in Winnipeg school children. As I have shown in Graph I, the incidence in girls increases after this age while in boys it rapidly declines.

In the Utah survey³ there was a greater difference in incidence in boys and girls. In boys, the greatest incidence (Table III) was

TABLE III.

INCIDENCE OF THYROID ENLARGEMENT IN UTAH SURVEY

Age groups.....	5-9	10-14	15-19	20-
Males.....	27.2	37.3	29.1	28.6
Females.....	41.5	60.0	65.3	58.6

From Beatty & Wallace (Utah Goitre Survey).

between 10 and 14; in girls, between 15 and 19. As in our series, however, after 14 the incidence in boys decreased while in girls it increased, to the alarming percentage of 58.6 per cent in girls over 20. It would appear therefore that at puberty there is a relative insufficiency of the thyroid gland. This manifests itself by some compensatory enlargement of the gland of varying degree. It would also seem that there is a tendency to spontaneous regression after puberty. This is in some way offset in the female, in whom the enlargement is prone to increase rather than diminish.

TABLE IV.

RELATIVE INCIDENCE OF SLIGHT, MODERATE AND LARGE THYROID ENLARGEMENTS IN CHILDREN

Age	Slight	Moderate	Large	Total
6	65	29	0	94
7	135	42	3	180
8	229	62	3	294
9	344	103	12	459
10	435	123	15	573
11	558	173	19	750
12	555	225	23	803
13	615	228	20	863
14	514	173	18	705
15	397	111	10	518
16	235	54	3	292
17	112	10	0	122
18	45	7	1	53
	4,239	1,340	127	5,706

Table IV shows the relative incidence of slight, moderate and marked thyroid enlargement at various ages in Winnipeg school children. Out of a total of 5,706 children with thyroid enlargement, 4,239, or 74.3 per cent, have only slight increase in the size of the gland. There were 1,340, or 23.5 per cent, with moderate enlargements, and 127, or 2.2 per cent, with large goitres. It will be seen, therefore, that only 25.7 per cent of the thyroid enlargements are moderate or large grades.

It is at this point that the question "When is a gland goitrous?" might be asked. There are 4,239 children classified in the slight thyroid enlargement group. Assuredly I am not classifying these as goitre, but merely as

thyroid enlargement. Is this a pathological or physiological enlargement? Is it an enlargement, or is it the normal size at that stage of development? Undoubtedly, no one can say that a child of 6 years, of such a height and weight, should have a thyroid of set dimensions. There is no hard and fast division between the size of a normal gland and of a goitrous gland. One must formulate his own standards, based upon comparison with what he finds in many other children. In this survey they are based upon the actual palpation by the author of thousands of glands, most of which were classified as normal. It is surprising the number of children one finds in which it is a very difficult matter to palpate the gland. In many the gland is readily palpable, but undoubtedly very small. Over and above these come the "slight enlargement" group. These are just a little larger, thicker and more readily palpable, something more concrete to palpate between finger and thumb. It is this group that I classify as slight enlargements. I do not claim they are goitres, but they are in the pre-goitrous state. They therefore require the care of a physician, and it is in the early stage, when the gland for some reason is under some additional burden, that most can be done to return the gland to normal.

The second and third group, moderate and large enlargements, are frankly pathological glands. The great majority of these glands were symmetrically enlarged, smooth, and contained no nodules. No effort was made to differentiate between or classify those symmetrically enlarged and those with one side distinctly greater than the other. A small number were found to contain adenomatous nodules, but they were not tabulated as such. Two important facts are to be noted from this survey. The first is that only 25.7 per cent of the thyroid enlargements present can be definitely defined as pathological. The second is that if one bases this number on the total number of children examined, he find that only 4.7 per cent of Winnipeg school children have pathological thyroid glands.

Unfortunately this survey is only of children. McCarrison⁴ greatly emphasizes the value of complete surveys of men, women and children in selected areas, that is, complete cross-section surveys. In this way one gets a composite idea

of the relation between the thyroid enlargements met with in children and its incidence in later life. Richards⁵ also emphasizes this. His experience is best set forth by quoting directly

TABLE V.

Name of School	Percentage	Nationality
1. Sir Sam Steele...	38.1	German and Ruthenian.
2. Lord Nelson....	35.8	Polish and Ruthenian.
3. Isaac Newton (Jun. High)	34.2	Polish, Ruthenian, Ukrainian, Jewish.
4. Florence Nightin- gale.....	31.1	Ruthenian, Polish, Ukrainian.
5. King Edward....	30.9	Jewish, Ruthenian.
6. Norquay.....	30.7	Ruthenian.
7. Wm. Whyte.....	30.1	Jewish.
8. Faraday.....	28.3	German, Ruthenian, Polish.
9. Alexandra.....	28.0	Canadian (British).
10. Aberdeen.....	25.5	Jewish.
11. David Living- stone.....	25.48	Polish, Ruthenian, Jewish.
12. Marg. Scott....	25.43	Ukrainian, Ruthenian, Polish, German.
13. Victoria.....	22.7	Canadian (British).
14. Dufferin.....	22.3	Canadian (British).
15. Hugh John Mc- Donald.....	21.6	Canadian (British).
16. Cecil Rhodes....	20.5	Canadian (British).
17. Machray.....	20.1	Jewish.
18. Earl Grey.....	19.8	Canadian (British).
19. Gordon Bell (Jun. High)...	18.55	Canadian (British).
20. General Wolfe...	18.52	Canadian (British).
21. Luxton.....	17.89	Canadian (British) some Jewish.
22. Strathcona.....	17.80	Jewish, Ruthenian, a few German.
23. George V.....	17.68	Canadian (British) and Ger- man.
24. LaVerendrye....	17.1	Canadian (British).
25. Argyle.....	16.9	Canadian (British), Ruthen- ian, Jewish.
26. Gladstone.....	16.8	Canadian (British).
27. Ralph Brown....	15.5	Canadian (British) and Ger- man.
28. Pinkham.....	15.29	Canadian (British).
29. Montcalm.....	15.23	Canadian (British).
30. Lord Roberts....	14.5	Canadian (British).
31. Isbister.....	13.7	Canadian (British).
32. Wolseley.....	13.35	Canadian (British).
33. Isaac Brock....	13.32	Canadian (British).
34. John M. King...	12.9	Canadian (British).
35. Elmwood.....	12.8	German, a few British Can- adian.
36. Julia Clarke....	12.3	Mixed.
37. Riverview.....	12.1	Canadian (British).
38. Greenway.....	11.6	Canadian (British).
39. Albert.....	11.2	Canadian (British).
40. Wellington.....	11.0	Canadian (British).
41. Anna Gibson....	10.8	Canadian (British).
42. Carlton.....	10.7	Canadian (British).
43. Champlain.....	10.0	Canadian (British), some Jewish.
44. Laura Secord....	9.7	Canadian (British).
45. Somerset.....	9.5	Canadian (British).
46. Fort Rouge.....	9.1	Canadian (British).
47. Glenwood.....	8.9	Canadian (British), a few German.
48. Mulvey.....	8.6	Canadian (British).
49. Grosvenor.....	8.2	Canadian (British).
50. Principal Sparl- ing.....	7.5	Canadian (British).
51. Robt. H. Smith..	6.2	Canadian (British).

Canadian (British) means children born in Canada of British descent.

from a personal communication from him. "One thing in particular was enlightening to me as I had the opportunity to examine every individual in a goitrous town. In seventy-odd school children all but two had goitres. The two without goitres had recently moved to the community. In the entire group there was one adenomatous goitre. These children were all of the grammar school age. Among the adult women there was over 80 per cent of goitre. Four out of five of the goitres were of the adenomatous type. This is an interesting observation of the transition of the endemic goitre in children, with the smooth contour and soft consistency, developing under constant conditions into such a high percentage of adenomatous goitre. As adenomatous goitre is very common in Winnipeg, the value of such a survey is apparent.

GEOGRAPHICAL DISTRIBUTION

The geographical distribution of goitre in Winnipeg is most interesting. I have arbitrarily divided the city into four school districts.

1. All schools west of the Red River and south of the Assiniboine.

2. A large district bounded on the south by the Assiniboine, on the east by the Red River, and on the north by the Canadian Pacific Railway tracks.

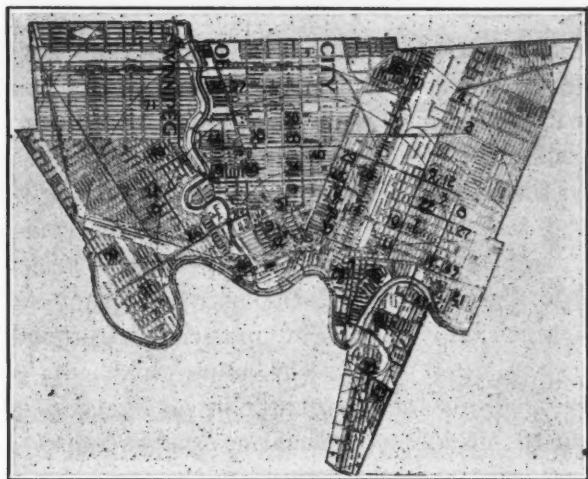
3. A large district north of the Canadian Pacific Railway tracks and west of the Red River.

4. A small district east of the Red River, namely Elmwood.

Table V is the incidence of thyroid enlargement found in Winnipeg schools. The schools are arranged in their order of highest incidence. Opposite each school one finds the predominating nationality in attendance at that institution noted. It is interesting to note that in the schools in which goitre is most prevalent children of foreign extraction are in the majority.

Map I shows the geographical position of the various schools. It will be seen that in that area north of the Canadian Pacific Railway tracks (district 3), goitre is most prevalent, especially the west end of the area, districts 1 and 4 are by far the least affected. It is interesting to note, however, that one school in Elmwood ranks first in the thyroid incidence in

marked contrast to the rest. This school is largely attended by German and Ruthenian children. District 2 has a well marked incidence of thyroid enlargement, especially in the area between Notre Dame and the Canadian Pacific Railway tracks.



Map I, of Winnipeg, showing the distribution of thyroid enlargement. The numbers on the map correspond to the numbers of the schools in Table V.

TABLE VI.

COMPARING HAMILTON'S SURVEY WITH THE PRESENT SURVEY

School	Hamilton	Abbott
Norquay.....	76.3	30.7
Livingstone.....	83.2	25.4
Mulvey.....	51.4	8.6
Lord Roberts.....	27.6	14.5
Carlton.....	23.6	10.7
Pinkham.....	77.9	15.2
Sam Steele.....	72.8	38.1

Table VI is a comparison of the incidence of thyroid enlargement found in Hamilton's and Abbott's surveys. In practically all cases the incidence now is less than half of that found by Hamilton. What is the reason? It might be that Hamilton classified glands as enlarged which in this survey have been said to be normal. This is unlikely. The explanation is probably twofold. As before stated, thyroid

clinics have been established and a great number of children have received thyroid treatment at these clinics. Then, again, many have been treated privately. Last and not least is the widespread sale of iodized salt. At the present time iodized salt is the salt sold to customers unless they specifically ask for non-iodized salt. At least one might say that in the past four years great success has been attained in the reduction of the incidence of thyroid enlargement in children.

SUMMARY

1. Thyroid enlargement is endemic in Winnipeg, as shown by its equal distribution in girls and boys.
2. The incidence in boys tends to decrease after twelve and increase in girls.
3. This would point to the fact that puberty has a much more profound effect on the thyroid in girls than in boys.
4. Slight thyroid enlargements are to be regarded as physiological, but are best kept under observation by a physician.
5. Medium and large thyroid enlargements are to be regarded as pathological and should be treated as such.
6. The relationship between thyroid enlargements in school children and goitre in adults has not been estimated.
7. Goitre is more prevalent in Winnipeg in those districts inhabited by peoples of foreign extraction.
8. Prophylactic thyroid therapy in Winnipeg has apparently reduced the incidence of thyroid enlargement more than 50 per cent in four years. The widespread use of iodized salt is possibly one of the greatest factors in the decrease.

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5. RICHARDS, Salt Lake City, personal communication.

LOCAL ANÆSTHESIA IN FRACTURE REDUCTION.—C. E. Stewart records four cases illustrating the simplicity and efficacy of local anæsthesia in the reduction of fractures. He injects 15 c.cm. of adrocain around the broken bone ends; this abolishes pain and muscular resistance, rendering the correct apposition and fixation of the fragments easy. The injection takes about twenty minutes to achieve its effect. The most scrupulous asepsis is essential, and the finest and sharpest needle must be

used. This procedure renders it possible to perform reduction by the roadside in the case of an accident, to transport the patient to hospital without risk of complicating the injury further, and thus to ensure a final completely satisfactory adjustment in the best possible conditions. The dangers and after-effects of general anæsthesia are avoided, prolonged muscular relaxation is obtained, less assistance is required, and the patient's full cooperation in any manipulation is ensured.—*Med. J. Australia*, September 12, 1931, p. 330.

A METHOD FOR THE REMOVAL OF THE CERVIX IN CLASSICAL HYSTERECTOMY

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SUPRAVAGINAL hysterectomy has many advantages over total hysterectomy, amongst which are the following:— The operation consumes less time, and as a result there is less shock to the patient. There is less danger of injury to the bladder and ureters. There is less danger of hæmorrhage. The ligaments attached to the cervix are left intact, and there is no post-operative prolapse of the vaginal vault. There is less danger of post-operative infection. There is, in consequence, a lower mortality rate. On the other hand, we do frequently, after a supravaginal hysterectomy, get cases with a persistent vaginal discharge, and occasionally a carcinoma of the cervix develops some months later.

The usual method of dealing with the cervix is to "core" it out. This does not adequately remove a constant source of after-infection or prevent the future development of carcinoma of the cervix. The method I use is as follows. Pre-operative cleanliness of the vagina is essential, to prevent infection, as in total hysterectomy. After the abdomen is opened and the uterus freed, the round ligaments and the broad ligaments are clamped and divided separately. The reflection of peritoneum on the bladder is divided and the bladder is pushed out of the way. The uterine arteries are dissected out and clamped.

The cervix is dealt with as follows. A circular incision is made around the cervix at the level of the vaginal vault. The incision is deepened only slightly into the cervical tissue. Then, exerting a moderate amount of traction on the uterus, the incision is carried downwards, parallel to the outer wall of the cervix and encroaching on the cervical tissue. The counter-traction exerted by the vaginal vault, which is fixed, peels off the vaginal vault along with the outer thickness of the cervical wall from the main body of the cervix down to the vaginal mucous membrane. One soon knows when this is reached. Then a stay suture is inserted at either end of the vaginal vault, passing below

the reflection of the mucous membrane on the cervix. This membrane is now divided through with a pair of curved scissors. Bleeding is sometimes free from the cervical tissue attached to the vaginal vault, but is easily controlled by the stay sutures, and others are inserted as thought necessary. A drainage tube is inserted into the vagina and the sutures through the vaginal vault tied. The operation is completed in the usual way. The round ligaments are sutured into the stump; the broad ligaments are closed off by approximating the anterior and posterior layers with sutures; the raw areas are peritonized. In this manner the cervix, except



FIG. 1

for a varying amount of its outer wall, is removed entirely. The technique described prolongs the typical supravaginal hysterectomy but a few minutes; shock to the patient is not increased; hæmorrhage is easily controlled; the attachments of the ligaments to the cervical tissue are left intact; and, with a proper pre-operative technique, the danger of infection is not increased.

This technique is not offered as a substitute for total hysterectomy, for the reason that there

are cases in which it is essential to remove an adequate amount of vaginal vault. It does however offer advantages over the classical supravaginal hysterectomy, without the dangers and difficulties of a total hysterectomy, in that it removes the cervix, except the small amount

necessary for the support of the vaginal vault, and, as such, a constant source of future infection and disease.

The accompanying picture shows the amount of tissue removed and the extent of the operation.

STUDIES IN CHOLESTEROL METABOLISM*

3. CHOLESTEROL AND GALL BLADDER DISEASE

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IN 1775 Conradi discovered a mystifying substance in gall stones. Ever since that time students of gall-bladder disease have attempted to correlate this malady with errors in cholesterol metabolism. Unfortunately, even now we know very little about cholesterol. Its synthesis and ultimate fate in the body are still matters of grave uncertainty. From the mists of obscurity surrounding this subject but few illuminating facts have arisen. It is known that cholesterol occurs in our food, the chief sources being egg-yolk, brain, fats, cream, butter, liver, kidney and certain leafy vegetables. It is probably a constituent of all cell membranes and is found in red cells, ovaries, brain, liver, the reticulo-endothelial system and the suprarenals. Considerable evidence has accumulated to show that cholesterol is for the most part an endogenous substance and is actively synthesized in the body. Cholesterol in the food has very little effect upon the blood level, unless a high fat diet is prolonged over a considerable period of time.

The cholesterol formed in the body is actively secreted into the bile. In the large bowel a goodly portion of this is converted into coprosterol, the remaining excreted cholesterol being partially reabsorbed. The total amount of cholesterol excreted by the faeces exceeds by many times that absorbed from the food.^{1, 2}

The normal cholesterol content of the blood lies between 130 and 200 mgrm. per 100 c.c. of blood. Increases occur in pregnancy (30 per cent show this increase six weeks before delivery, rising to 80 per cent on the day of confinement.)³

In the nephrotic stage of glomerulonephritis, atherosclerosis, jaundice, and diabetes, notable increases occur. The content is low in acute infections, in Addison's disease, and in some of the anæmias. In pernicious anæmia there is a striking rise in the blood cholesterol preceding the reticulocyte crisis. On account of the frequency of gall-stone attacks in pregnant women, Chauffard⁴ urged that the gall stones were the result of the high cholesterol content of the blood. Along with others^{5, 6, 7, 8} he contended that hypercholesterolaemia was also a valuable diagnostic sign in cholelithiasis. On the other hand, careful work by well known workers^{9 to 14} in this field has shown conclusively that there is no constant rise in the blood cholesterol in the presence of gall stones. This does not entirely exclude hypercholesterolaemia as a factor early in the formation of these stones, but proves it has no value as a diagnostic aid. Other conditions associated with it, *e.g.*, nephrosis, show no abnormal incidence of gall stones. In pregnancy the cholesterol in the bile is quite low. Fox¹⁵ has made a careful study of cholesterol found in the bile. He found the average content of liver bile to be 0.06 per cent and that of normal gall bladder bile 0.38 per cent. Fluids were increased and solids diminished in liver bile, while the gall bladder bile was highly concentrated.

PHYSIOLOGY OF THE GALL BLADDER

Bile is stored in the gall bladder, where it is concentrated from six to ten times in health. It is secreted continuously by the liver, and its entry into the gall bladder depends upon the occlusion of the common duct at its distal end. This occlusion during fasting is maintained by

* From the Department of Medicine, University of Manitoba. The first two articles in this series will be found in the *Canad. M. Ass. J.*, 1932, 26: 30 and 158.

the rudimentary sphincter of Oddi and by the more important muscle fibres of the duodenum which surround the duct in its oblique course through this structure. It is the tone of the duodenum that regulates the flow of bile, not the relaxation of the sphincter of Oddi. Increased pressure in the ducts will overcome the tone of the duodenum, but during digestion peristalsis of this structure results in a discharge of accumulated bile. The emptying of the gall bladder depends then upon the relaxation of the duodenal musculature and the factor of elastic recoil of the gall bladder itself. Various drugs, notably magnesium sulphate and adrenalin, will cause the gall bladder to empty, but the most vigorous response takes place following the ingestion of egg-yolk, lecithin and other fatty foods. There is some evidence to show that these foods also increase the flow of liver bile and call forth some substance in the blood which stimulates the gall bladder to contract. Fresh bile from the liver enters the cystic duct continuously. This dilute bile washes out the more concentrated bladder bile and is a factor in the emptying process. Small quantities of bile may be discharged intermittently throughout the day, but the greatest excretion occurs some time after a heavy fat meal. With regard to all fatty foods, the most rapid and complete emptying of the gall bladder occurs upon feeding egg-yolk. This emptying process takes from two to five hours.

The gall bladder absorbs water in a striking fashion. The liver bile is concentrated rapidly from six to ten times in health (50 c.c. bladder bile equals the solids of 3,500 c.c. liver bile). It is now generally believed that the normal gall bladder absorbs cholesterol to a certain extent.¹⁶ As the gall bladder is never completely emptied, absorption is continuous. In the Graham Cole test the appearance of the shadow is due to water absorption, the phenoltetraiodophthalein being absorbed to a very slight degree. The disappearance of the gall bladder shadow is thus due to emptying of the gall bladder, rather than to absorption of the dye into the blood stream. Boyd¹⁷ believes that most rapid absorption takes place when the gall bladder is in a partially collapsed state. At this time the lumen of the gall bladder is nearly filled with fungiform projections of the mucosa and is naturally more vascular than in the distended state.

CHOLESTEROLIS OF THE GALL BLADDER

By far the most interesting lesion of the gall bladder is cholesterolosis, or the "strawberry gall bladder", so ably described by Moynihan, McCarty, Boyd and others. Evidence by Boyd, Wilkie, Judd and others seems to prove that cholesterolosis does not occur without a concomitant or preceding infection of the gall bladder wall. Such inflammatory changes may be gross or microscopical. If they are occasionally absent in the gall bladder when examined by the pathologist, this is no serious argument that inflammation has not occurred previously. Inflammation has been known to be recurrent and also to subside, leaving little trace of its former presence.

How does this inflammation affect the concentrating power of the gall bladder mucosa? Water absorption is apparently unaffected. In most cases of cholesterolosis the gall bladder can be visualized clearly with the Graham-Cole test. The concentration of the opaque iodine depends almost entirely upon water absorption. What of the other constituents of the bile? Andrews¹⁸ has recently shown that calcium is concentrated six to ten times by the normal gall bladder. Following experimental infection, concentration power for calcium is increased twenty times. Boyd¹⁹ has shown a tremendous increase in cholesterol in the gall bladder wall in cholesterolosis. In an effort to explain this phenomenon, the cholesterol content of the bile was estimated in gall bladders removed at operation. In 15 cases examined by us a striking increase

TABLE I
CHOLESTEROL CONTENT OF GALL BLADDER BILE
AT OPERATION

Case	Grm. per 100 c.c.	Chronic		—Stones—		Pig- ment
		Chole- cystitis	Choles- terolosis	Mixed	Chol.	
M.I.	1.248	1	4	0	4	0
H.I.	0.691	2	2	0	0	0
H.E.	0.591	3	2	1	0	0
L.I.	0.520	2	3	0	1	0
E.S.	0.437	3	0	0	4	0
F.E.	0.433	1	2	0	2	2
L.E.	0.333	0	3	3	0	0
S.M.	0.305	1	0	4	0	0
B.U.	0.287	3	0	4	0	0
T.R.	0.275	1	0	0	0	0
S.E.	0.264	2	0	0	0	4
H.U.	0.231	4	0	0	0	0
W.O.	0.183	1	0	0	0	0
A.N.	0.176	4	0	0	0	4
C.H.	0.135	1	0	0	0	0

N.B.—The degree of macroscopic and microscopic cholesterolosis has been graded 1 to 4. Average normal figure for cholesterol contents 0.380 gm.

was found in cholesterolosis or in the presence of pure cholesterol stones. The lowest figures were obtained in well marked chronic cholecystitis. (See Table I.) The high cholesterol content of the bile in the strawberry gall bladder suggests that, while water absorption is little interfered with, the absorption of cholesterol is quite definitely impaired. Since both calcium and cholesterol absorption are thus affected, one may assume that the solid matter of the bile is retained and the water absorbed. The impediment to the absorption of cholesterol quite obviously lies beneath the mucosa. The striking deposits of cholesterol esters so ably described by Boyd lie in the mucous and submucous coats. Inflammatory changes are usually found in the deeper layers.

The sequence of events in gall-bladder disease would seem to be, firstly, a mild infection of the gall bladder wall, followed by decreased permeability of the wall for cholesterol. This leads to loading of the mucosal layers with cholesterol esters and an increase of cholesterol in the bladder bile itself. Cholesterol polypi may form in the mucosa, which eventually drop into the gall bladder and form nuclei for gall stones. The highly concentrated bile becomes saturated with cholesterol and conditions are ripe for calculus formation. As inflammatory changes progress, the gall bladder becomes a functionless tube—a graveyard for gall stones.

Ivy, in some interesting work, states that human gall stones placed in the gall bladder of the dog disappear in several months. Cholesterol stones have never been found or produced experimentally in the dog. The cholesterol content of dog and human bile is relatively the same. There is, however, a tremendous difference in the cholesterol saponifiable ratio in human and dog bile. Saponifiable substances are twenty times greater in dog bile. These saponifiable substances are fat, fatty acids, soaps and lecithin. Soaps, especially the soap of lauric acid, are the most potent solvents of cholesterol, and he believes that it is the presence of these soaps in dog bile which prevents formation of stones and actually dissolves them *in vivo*. Cocoanut oil is the best source of lauric acid, and in the diet may be of prophylactic value, although we have no evidence yet of increases in these substances in the bile following ingestion.

It is of interest to note here the striking

character of the bile in these cases of cholesterolosis. It is dark, tarry, and extremely concentrated, much more so than one would expect from mere pre-operative fasting. It is conceivable that in this bile the ratio of bile salts and cholesterol is disturbed. Bile salts tend to hold the cholesterol in solution. We have, however, no satisfactory method for the clinical estimation of bile salt content.

THE DIAGNOSIS OF CHOLESTEROLOSIS

Cholesterolosis is found in about 20 per cent of the cases operated upon for gall-bladder disease. It affects the sexes equally (Mentzner large autopsy series). It is a condition of middle life, at the average age of 35 to 45. The symptomatology is varied and it is almost impossible to make a definite pre-operative diagnosis of cholesterolosis, since the condition is merely an early stage of inflammation of the gall bladder. This is perhaps of academic interest. The signs and symptoms always point definitely to a lesion of the biliary tract, and the diagnosis of cholesterolosis depends upon the exclusion of grosser lesions and the use of cholecystography. This test in cases of pure cholesterolosis always results in a dense normal gall-bladder shadow. The presence of "negative" or cholesterol stones may be seen in the visualized gall bladder if the condition has gone on to stone formation. Later on, when inflammatory changes are marked, the dye fails to concentrate and there is no gall-bladder shadow. At this stage, if gall stones are present, calcium may be deposited and positive shadows under the x-ray result.

RELATION OF HYPERCHOLESTEROLEMIA TO GALL STONES

Has a high cholesterol content of the blood any relation to the production of gall stones? Peters and Van Slyke believe it quite unnecessary to presume that cholesterol has any relation to the cause of gall stones. McMaster and Drury have shown that the excretion of cholesterol in the bile may be entirely independent of its concentration in the blood. Pribham finds the bile cholesterol to be low in pregnancy, in which hypercholesterolemia frequently occurs. Muller²⁰ believes that two kinds of hypercholesterolemia exist, namely, (1) a retention type in which less cholesterol is excreted through the bile, as in pregnancy, nephrosis and mechanical

obstruction, and (2) a hypercholesterolaemia accompanied by increased excretion through the bile, as seen after prolonged high cholesterol feeding. The first type suggests damage to the liver as an excretory organ.

The retention type occurs during pregnancy, the bile cholesterol being low, and the threshold of excretion of the Kupffer cells being raised. This low bile cholesterol makes it difficult to explain the frequent occurrences of cholesterolosis in pregnancy, especially since the concentrating power of the gall bladder is apparently diminished in this condition, but one must remember that inflammation of the gall bladder occurs in every case of cholesterolosis.

EFFECT OF FEEDING CHOLESTEROL IN GALL BLADDER DISEASE

Twenty cases of cholecystitis and cholelithiasis were given 10 grams of cholesterol while in the fasting state and an hourly determination of blood cholesterol was made over a period of five hours. The result of cholesterol feedings in normal individuals has been discussed in a previous paper. The fasting readings for the normal and for the gall-bladder cases averaged about the same. Following the 10 grams of cholesterol, the percentage of change averaged 18 in cholecystitis, and 16 in cases of cholelithiasis. The average change after feeding in normal cases was 8 per cent. The range from low to high is more marked in persons with gall bladder disease. (See Table II).

If these figures are corroborated they will be significant. They suggest some definite derangement of cholesterol metabolism in gall-bladder disease. Cholesterol is excreted by the liver and the liver is frequently the seat of a widespread fibrosis in cholecystitis. This derangement may be associated with delayed excretion by the polygonal cells of the damaged liver.

From a study of this nature one may draw conclusions of some practical value. One realizes that, in mentioning "inflammation", one calls forth visions of the surgeon's knife. Fortunately, many cases of cholesterolosis or early infection of the gall bladder get better (this is well seen in those cases occurring during pregnancy). The pathologists give evidence of "silent" gall stones whose presence was unsuspected by patient or physician. Unless complicated by severe colic and pain,

medical treatment may be tried with some success, and in the case of cholesterolosis with complete recovery in some instances. On the basis of physiological and pathological facts, it would seem of considerable importance to dilute the gall bladder bile in these cases, and also to make certain that the gall bladder is thoroughly emptied once a day. Dilution may be induced by increasing the flow of liver bile. Taurocholic acid is the most effective cholagogue known, and bile salts have been used empirically for years with some success. Gall bladder contraction is best produced by administering egg-yolk, cream or olive oil.

TABLE II
EFFECT OF CHOLESTEROL FEEDING

Cholecystitis			Increase	
Case	Initial	Maximal	Mgrm.	Percentage
R.O.	177	185	8	4.5
B.Y.	190	190	0	0.0
P.U.	166	220	54	32.5
D.E.	187	191	4	2.1
B.E.	161	230	69	42.2
T.I.	200	231	31	10.5
S.Z.	151	176	25	16.5
S.T.	164	195	31	18.6
S.M.	200	251	51	25.5
M.Y.	201	201	0	0.0
C.H.	178	238	60	33.7
Mc.M.	205	272	67	32.6
				12/217.7
Average Increase				18.1
Cholelithiasis			Increase	
Case	Initial	Maximal	Mgrm.	Percentage
P.A.	228	228	0	0.0
M.A.	186	188	2	1.0
M.O.	177	215	38	21.4
K.O.	213	271	58	27.2
S.T.	164	195	31	18.8
D.O.	132	163	31	23.4
F.O.	183	220	37	20.2
				7/112.0
Average Increase				16.0
Normal Cases			Increase	
Case	Initial	Maximal	Mgrm.	Percentage
E.L.	193	193	0	0.0
K.E.	173	177	4	2.3
P.E.	157	225	68	43.3
B.L.	191	215	24	12.5
M.A.	229	229	0	0.0
M.O.	194	194	0	0.0
E.X.	186	227	41	22.5
E.N.	212	228	16	7.5
F.R.	145	154	9	6.0
M.E.	169	174	5	2.9
O.P.	166	170	4	2.4
Mc.L.	162	165	1	0.6
				12/100.0
Average Increase				8.3
Average Mean			177	
Average Range			33	

The high fat treatment of cholecystitis has long been advocated by Gainsborough, Hurst and others. They maintain, rightly, that reduction of fats produces gall-bladder stasis, removing the stimulus to normal contraction.

Increased flow of bile and periodic emptying of the gall bladder will without doubt reduce the concentration of cholesterol in the gall bladder, and perhaps prevent the formation of stones. In the chronic cases, where the gall bladder is a functionless tube, there is no logical reason for such treatment. In these cases a fat free diet will provide symptomatic relief.

SUMMARY

1. High concentrations of cholesterol were found at operation in the thick viscid bile of the strawberry gall bladder.

2. The cholesterol in the blood was signi-

ficantly increased upon feeding this substance to persons with gall bladder disease.

3. The physiology of the gall bladder is discussed and the treatment based upon physiological principles outlined.

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BLOOD GROUPS IN CLINICAL INVESTIGATION*

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THE fact that blood groups are inherited according to definite laws is a temptation to associate with them other conditions that have been laid at the door of heredity. Here I will only discuss the four blood groups and use Jansky's classification throughout. Before making any analysis of the possible place of blood groups in man, it might be well to enumerate a few of the conditions which, it has been thought, may be associated with them.

McQuarrie¹ found in 14 cases of toxæmia of pregnancy that in 75 per cent the mother and child belonged to incompatible blood groups. In 70 per cent of 18 cases of potential toxæmia, the mother and child were of different blood groups. Goodall states that isoagglutination may be reasonably assumed to appear in the last three months of pregnancy, when toxæmia is also prone to occur. Levine² has shown that atopic hypersensitive children may or may not have the blood groups of the atopic parent. His 15 families give evidence of the mixed blood group ancestry of these atopic hypersensitive individuals. Hirsfeld and Brokman³

have shown that the isoagglutinins have no direct relation to diphtheria immunity, that is, individuals of all groups may be Schick positive or negative but if parents belong to different blood groups and one parent is Schick positive and the other Schick negative the children with the group of the positive parent are positive, while those inheriting the group of the negative parent are very rarely positive.

Amsel and Halber have reported that individuals of blood group i (Jansky) become Wassermann negative in a shorter time than those belonging to blood group iv.

Coming to mental diseases, Proescher and Arkush⁴ have reported on some 2,104 cases of different forms of mental diseases. Beside the distribution of these cases into their various blood groups, they place a considerable collection of blood groups on normal individuals. Their results are quite convincing when comparing percentages of a given blood group among normals with the percentage of the same blood group among the mentally afflicted. Blood group i is rather uniformly increased in dementia præcox, manic-depressive insanity, epilepsy, general paresis and what are labelled

* Read before the Section of Pathology, Academy of Medicine, Toronto, February 23, 1931.

"Other mental diseases". Blood group ii, on the other hand, shows a marked decrease in representation in these ailments as compared to the normal percentage given for this group. Blood group iii stands rather stationary through the four mental ailments specified, but has a very marked rise in the division designated as "other types of insanity". Blood group iv has a marked drop in all types except general paresis. Their general conclusions are that blood groups i and iii have twice as great a chance to develop psychosis as members of group ii, and four times as great as members of group iv.

Turning to cancer, Alexander⁵ in 1921 gave blood groups for 50 cases of malignant disease and found that while persons belonging to all four blood groups were liable to be afflicted with this ailment, those of groups iii and iv are peculiarly susceptible and the disease is, generally speaking, more malignant.

Weitzner determined the blood groups of 84 patients with carcinoma and of over 1,000 controls. The group percentage in cancer cases was 16.6 for group i, 42.9 for group ii, 14.3 for group iii, and 26.2 for group iv. The outstanding finding in this work compared with his controls was the indication of a predisposition to cancer among group iv and a resistance to it in group i.

Suk has found that the percentage of faultless teeth is greater for blood group i and lower for blood group ii. In the same work, there is indication that the percentage of blood groups iii and iv is higher among a selected group of 685 young men than among his general series of 3,010 cases. These cases are from Moravia and the value of the work is, to me, therefore much greater because the source of material has been specified.

Before ending this short list of reports from the literature, it might be well to add that abortions seem much more common among women of blood group ii, and that hæmorrhage and anæmias are more frequent in blood group iii.

Of the above statements of reported association of blood group and disease, some have remained unchallenged, and others, especially those pertaining to cancer, have been challenged severely.

These reports from literature are only a very

meagre representation of what could have been given, but will serve the purpose at hand, that is, to unscramble some of these facts and see if there is any common basis on which to build more successfully. That isoagglutinins are a common property of all human serum is a possibility that seems plausible, if we assume that they have been withdrawn in those cases where they would be incompatible with life. Isoagglutinogens, on the other hand, are not so widely spread, but seem to be more specific and limited. I would like to place on record an abbreviation of Ottenberg's Table of percentage distribution of the four blood groups in Europe and Asia.

Nationality	i	ii	iii	iv	No. of persons tested
	O	A	B	AB	
English	46.4	43.4	7.2	3.0	500
Swedish	33.5	51.0	10.0	5.5	500
French	43.2	42.6	11.2	3.0	500
German (Leipzig)	34.5	41.5	16.5	7.5	1000
Russian	40.7	31.2	21.8	6.3	1000
North Chinese	30.0	26.0	34.0	10.0	1000
Hindus	31.3	19.0	41.2	8.5	1000

It will be seen from the above Table that the two blood groups which are the carriers of a single isogglutinin in their cells have a very varied distribution. Blood group ii, for instance, is most concentrated, according to these figures, among the Swedish people, and is less concentrated the farther one is removed from Scandinavia. It seems reasonable to assume that this blood group had its development in that peninsula. Blood group iii, on the other hand, reaches its greatest concentration among the Hindus and, in all probability, had its origin there. These two groups seem to have been carried to western Europe by invaders from Scandinavia, on the one hand, and from Asia on the other.

Evidence of a sex difference in blood group percentage is seen in our male and female population here. Among men groups iii and iv are higher in percentage than among women. I have been, however, unable to get reliable figures for large numbers that are truly comparable, as I do not consider transfusion records suitable for this purpose since selection has unwittingly taken place. In keeping with this possible sex difference, in Suk's 685 selected young men, groups iii and iv, were also of higher percentage than those taken from his general series.

I hesitate without more reliable data to suggest what the expected percentages of the

various blood groups for an assembled population, such as we have on this continent might be. I, therefore, put more dependence, for my present purpose, on Ottenberg's figures taken from more stationary populations.

Having suggested the possible origin of groups ii and iii, it might be well to comment on the possible place of blood group i. This group is found among many peoples, but the one in which we are chiefly interested is the one which forms such a large part of our own population, that is the "blood group i of western Europe." The problem is considerable and is aptly put by Fleure, "We are nearly all mosaics of inheritance from our varied ancestry. In some characters inheritance seems blended, while in other parts of our inheritance characters are handed down with considerable constancy." Blood groups can be considered as an instance of the latter. It is not likely that blood group i was carried to western Europe at the same times as were groups ii and iii for it is less concentrated in the possible sources of these two groups than it is in western Europe.

Since invaders are usually male, survivors of invasions are usually female. If blood group i (western Europe) was carried by a definite race which occupied the area in question previous to the two suggested invasions, it is the female population which would likely retain most of the former physical characteristics. By using the next most frequent blood group (group ii) as a means of comparison, polygons of frequency for the two groups of women will reveal interesting differences. Standing height for group i takes a broad uniform area in the field, while group ii picks out a more defined and limited area. The external conjugate of group ii leans to the side of the field represented by the longer measurements. The use of this last test is for primiparae only, as the external conjugate has been found to vary directly with the weight and height of the patient, and weight varies irregularly in multiparity. The length of the head from before backwards finds group ii leaning to the longer headed field. In head height, group i is best represented in the higher headed part of the field. Group i also takes this place with regard to face length, but this is also true of face breadth, with the result that their faces appear shorter than those of group ii.

In summing up the distinguishing characteristics of blood group i among women, we see the

picture of the type described by Ripley as inhabiting the Dordogne and connected by him with Aurignacian man in western Europe. A race carrying blood group i seems highly likely to have inhabited western Europe previous to invasions from the north or the east. That it was the blending of different types of individuals is suggested by the wide scope and uniformity of the frequency curves, for this group, mentioned above. This group, it might be added, is most frequent over the area occupied by the former Roman Empire. In spite of the fact that women of this group have a more prolonged average duration of labour, they seem to have larger families than women of other blood groups. In Wiener and Vaisberg's⁶ series of 131 families, blood group i parents were the only group to average over 5 children in a family, group iv excepted. This was true whether they married into their own or other groups. The proportion of male and female offspring is the most even also for blood group i.

Having attempted to establish three different stocks entering into the composition of western European population, I wish to mention some of the marriage possibilities. Group i individuals seem to be married earlier than the other groups. From what data I have been able to gather, blood groups of individuals married before the age of 21 seem to follow the usual expectation of pure chance. On the other hand, those married after this age seem to marry those of their own blood group much more frequently. Whatever the factor, be it chance or otherwise, the percentages of the various groups in a given population have a definite effect on the result. In Wiener and Vaisberg's series, 47.9 per cent of group i individuals married into their own group, while only 35.0 per cent group ii married into their own group. For group iii, this percentage was reduced to 21.6 per cent. No group iv individual was married to a member of his own group. This last statement brings me to the consideration of the place blood grouping can hold as an aid to clinical investigation.

Turning to Alexander's⁵ findings in regard to cancer, we can assume that his cases were collected from the vicinity of Dundee. The nearest percentages for the four blood groups at hand for this area are from England, as shown in Ottenberg's⁷ table. Here we find the

percentage of group iii stated to be seven. This is the lowest percentage for this group reported for either Europe or Asia. Taking account of the marriage possibilities stated above, the chances of group iii individuals marrying into their own group are rather remote. In fact, if this low percentage is general throughout England, one could imagine a group iii individual being so mixed that only the blood group remains of former racial characteristics. Needless to say, the same composition could exist with another blood group. I hope I have made clear the fact that physically an individual can be quite different from another, though they might have one factor in common, that is the blood group. Comparing the German statistics from Leipzig, it can be seen that group i and ii have not the same chance of marrying into their own groups as they have in England. On the other hand, this opportunity is much greater for group iii. It seems reasonable that the physical composition of individuals from these two localities would be quite different even though they may carry the same blood group. Any comparison of clinical material in the one with that in the other would be misleading. Chimney-sweep's cancer has been called an English disease;

blood groups of sufficient number of these cases would be of interest if compiled properly.

To make use of blood groups associated with clinical statistics, one should divide these as to racial origin. Percentage tables for the many more or less stable populations of western Europe would also be valuable. The use of subgroups may be of immense value in this regard, as also heterohæmagglutination described by Landsteiner and Levine.^{8,9} By the association of these methods blood groups, I feel, could be made to fill a place clinically similar to that of the blood sugar or any other instrument of diagnosis.

Blood groups are possibly linked with mental characteristics as well as physical, but to expect them to be linked with many is expecting more from them than from other physical factors. Parallelisms, when used rightly, will bring much information which is of real value, while the search for linkage is likely to be futile in most attempts.

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THE OLEOTHORAX TREATMENT OF PURULENT TUBERCULOUS EFFUSIONS

(WITH A REPORT OF TWENTY CASES)

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PURULENT effusion, either complicating artificial pneumothorax or arising from tuberculous pleurisy, has been one of the most discouraging problems in the treatment of tuberculosis. Indeed the frequency of this complication in artificial pneumothorax and the unsatisfactory end result form one of the chief arguments against earlier and more frequent use of collapse therapy, and thereby become the chief argument in favour of thoracoplasty in preference to pneumothorax whenever possible.

The incidence of serous and purulent effusions in the course of artificial pneumothorax varies widely in the published reports. In our series of 105 cases, with compression of sufficient

degrees to warrant continuation of the collapse therapy, effusion occurred in 39, or 37 per cent. In 22 cases, which is 21 per cent of the whole series, or 56 per cent of effusions, the fluid ultimately became purulent. By purulent fluid is meant definitely thickened fluid remaining as an opaque suspension on standing, without reference to bacterial or cell content, and which in our experience tends to recur promptly following aspiration to form thoracic wall or bronchial fistulæ, to persist and progress to amyloid disease and a fatal termination.

Tuberculous empyema, with these ever-present dangers of perforation, thoracic or bronchial fistula, secondary infection, sepsis and amyloid

disease, has a very unfavourable prognosis and a high mortality. Fontaine's figures for purulent effusion in pneumothorax are 85 per cent mortality, made up of 48 per cent in which adhesions destroy the effectiveness of collapse, and 37 per cent terminating in fistula and secondary infection.

The treatment recommended ranges from non-interference, through repeated aspirations, with or without irrigations or air replacement, injection of solutions of methylene blue, acriflavin, gentian violet, mercurochrome or other dyes, to an Estlander Schede or the more recent extra-pleural thoracoplasty. Results in our experience have been disappointing, the most satisfactory being where early and repeated aspiration has been performed (with saline irrigation if necessary) in the hope that re-expansion and obliteration of the pleural space may occur before the lung becomes permanently bound down, and that nature would complete the arrest of the underlying pulmonary lesion, suitable cases, and those in which re-expansion failed to occur being referred for thoracoplasty.

Although continental workers had been employing gomenol in oil in small quantities since 1916, and massive injection into the pleural cavity was made by Bernou in 1922 (the term "oleothorax" was introduced by him), little attention was given to the method in this country. Threatened with ultimate failure because of the development of purulent effusion in a number of patients undergoing pneumothorax treatment, and influenced by favourable results observed during an European tour in 1928, it was decided to try oil replacement. Twenty cases so treated form the basis of this report.

Gomenol is an essential oil, readily volatile, and with a pleasant odour, obtained by distillation from the leaves of *Melaleuca viridiflora*, a species of myrtle found in Gomen, New Caledonia. It has been used as a local application extensively, especially in France, in nasolaryngeal and genito-urinary practice. It is believed to have a specific bactericidal action on the tubercle bacillus. For use in the pleural cavity it is dissolved in strength of 2 to 10 per cent in sterile olive oil or liquid paraffin. The latter is non-absorbable and has some advantages in certain cases, but at least one paraffinoma has been reported from its use. Olive oil is the vehicle of choice, using only oil of highest purity, neutralized and thoroughly sterilized,

the gomenol being added after sterilization. Convenient flasks, containing 250 c.c. of any desired percentage of gomenol in olive oil, are now available in Canada.

Detailed descriptions of oleothorax, its actions, indications, technique, accidents, together with an elaborate classification of pleural effusions have recently been published, (Gilbert, *Tubercle*, 1930, 11:). From a cautious beginning with purulent effusion complicating artificial pneumothorax, we have gradually extended the application to include four groups which correspond closely with the major indications of Gilbert. Overlapping occurs, certain cases belonging to two or more of the four groups into which the series is divided. In practice each case must be selected individually, having regard to the probable course and to one's ability to control or modify it.

Purulent effusion, whether complicating artificial pneumothorax or arising from primary tuberculous pleurisy, is the major indication. No attempt has been made to subdivide this group according to rapidity of onset, severity of symptoms, or richness in bacilli. A second indication, one which is almost constantly associated with the first group, but which not infrequently occurs without effusion, is the appearance of obliterating adhesions. These, if allowed to proceed, will so decrease the pleural space that effective collapse is no longer possible and collapse treatment must be abandoned before sufficient or maximum benefit has been obtained. Spontaneous pneumothorax in a non-collapsed lung or a bronchial fistula in the course of pneumothorax treatment is the third indication. Here it may be wise to wait for spontaneous closure or the appearance of pus, since closure without infection does occur at times, and since oil, injected when the pleura is sensitive and not protected by exudate, may lead to a severe reaction. Lastly, oleothorax, completely filling the pleural space and maintaining a constant positive pressure, may succeed in collapsing a resistant area or a cavity when pneumothorax alone has failed to do so and when surgery is contraindicated or has also failed.

Continental technique requires the usual pneumothorax apparatus and puncture and a second apparatus consisting of a large calibre needle, tubing, an oil monometer, a special oil container immersed in warm solution and a bellows or syringe to overcome resistance to the

flow of a viscid oily fluid which is introduced through a second puncture. With only a 50 or 100 c.c. syringe and adapter, in addition to the usual pneumothorax apparatus, and through a single puncture, using a gauge 16 needle, we have been able to aspirate pus, irrigating if necessary, and to introduce some twenty-five litres of gomenol in oil into the pleural cavity in twenty cases of this series without difficulty or accident. Anyone experienced in giving artificial pneumothorax should find this simple technique safe, satisfactory and not excessively time-consuming, if the following rules are carefully observed.

1. Examine under the fluoroscope before and after each oil injection, marking the upper and lower limits of fluid, choosing for puncture a site which will avoid adhesions, expanded lung or elevated diaphragm, but which will permit complete emptying of the pleural space when a suitable position of the patient is secured.

2. Use a needle of 16-gauge or slightly larger. This is large enough to allow rapid introduction of oil, will permit easy withdrawal of fluid, with or without saline irrigation, is satisfactory for manometer readings, and yet small enough to avoid leakage or needle track infection.

3. For aspiration, place the patient in a sitting posture, puncture near the anterior axillary line at the lower limit of fluid previously marked, and have the patient bend forward until the fluid is completely evacuated. By changing the position of the patient air or oil may be introduced or manometer readings taken at will.

4. A glass syringe, 50 or 100 c.c., will serve to aspirate fluid, to introduce oil or irrigating fluid, the operator soon acquiring judgment regarding the suction or pressure required, while oil or fluid under negative pressure will of itself act as an excellent safety valve and indicate the necessity of air replacement as the fluid is withdrawn.

5. Until fluid has ceased to form, keep a

residue of air which can by lowering the table or turning the patient always be brought to the site of puncture, and allow manometric control of pressure at any time, so that unduly high pressures may be avoided. Frequent fluoroscopic examination is essential as long as fluid re-forms.

6. Aspirate the pus completely, replacing with air, which will in turn be replaced with fresh oil, and repeat the aspiration as often as indicated by symptoms and fluoroscopic findings. As soon as possible introduce oil in sufficient quantity to bathe the entire pleural surface, the amount being determined by the quantity withdrawn and the rapidity with which new pus is formed.

7. For sterilizing the pleural cavity, use 10 per cent gomenol solution. When purulent fluid is withdrawn, reaction need not be feared, and quantities of 250 to 500 c.c. may be introduced at once. When only clear oil is withdrawn at subsequent sittings, the oleothorax may be made complete and may be maintained indefinitely by the addition of small amounts of oil at intervals of one to three months to compensate for absorption. A solution of 2 to 5 per cent will suffice for this. Ultimate withdrawal in whole or in part will be determined by the character and extent of disease in the collapsed lung, the severity of pleural infection and the choice of subsequent treatment.

8. Oil is never indicated in acute pleurisy or during the acute stage of effusion. Wait until fever subsides and until the fluid is definitely thickened.

9. In beginning oleothorax for adhesions, perforation, or collapse of a persisting cavity, in the absence of purulent effusion, reactions are to be anticipated, and testing of tolerance by injecting 5 or 10 c.c. of oil must first be done. Use 2 per cent oil, and, if reaction occurs, allow time for pain and fever to subside, repeat the test, and gradually increase the amount introduced, producing complete block-

TABLE I

<i>Indications for Oleothorax</i>		<i>Result</i>			
T.B. empyema	17	Cleared 15—Improved 1—Unimproved 1			
Obliterating adhesions					
After effusion	7	Controlled 7			
Primary	3	Controlled 2 Failed 1			
Bronchial fistula					
After oleothorax	3	Closed	0	Doubtful 1	Died 2
Before oleothorax	2	Closed	1		Died 1
Needle track fistula	4	Closed	3		Died 1
Empyema necessitans	2	Closed	2		

TABLE II

Present condition of 20 cases

Well and working	9		
Relapsed after working two years	1	Improving (doubtful)	2
Markedly improved	4	Dead	4
	14		

ing with oil as soon as tolerance is established.

The results for the 20 cases are shown in Table I. The overlapping of groups is evident and may be illustrated by the one death in the empyema group. This patient had an uncollapsed cavity and a needle track sinus at the commencement of oleothorax. Neither was benefited and it is presumed bronchial fistula occurred immediately preceding sudden death in another city. The present condition of the 20 cases, shown in Table II, is perhaps a better indication of the value of oleothorax in a group of cases with a distinctly unfavourable prognosis.

CONCLUSIONS

Oleothorax with gomenol in olive oil is recommended as a useful procedure in the control of purulent tuberculous effusions complicating artificial pneumothorax, either as a temporary measure to be followed by thoracoplasty, or as the best available treatment for those in whom disease in the other lung, or the condition of the patient contraindicates surgical interference. When obliterating adhesions threaten the effectiveness of collapse therapy, a blocking oleothorax will control the progress of adhesions and maintain a measure of collapse, at the same time greatly lengthening the interval between refills, and thus minimizing the inconvenience to patient and attending physician. It is worthy of trial in the otherwise desperate cases with persisting bronchial fistula following spontaneous pneumothorax or perforation in a collapsed lung.

INFLUENZAL MENINGITIS*

BY A. P. HART,

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MENINGITIS produced by the *B. influenza* is so often looked upon as fatal that when one of the following patients here recorded recovered recently we thought it advisable to study the records at the Hospital for Sick Children in Toronto. It is of course well known that some of these patients do recover. Rivers,¹ who reported 23 cases from Johns Hopkins Hospital in 1922, over a period of ten years, reviewed the literature and found that out of 220 cases which had been reported up to that time 17 recoveries were recorded. Of the 23 cases at Johns Hopkins Hospital only 1 recovered. Since 1924 we have records of 32 cases at the Hospital for Sick Children in Toronto, with only 2 recoveries. It will be evident from these figures that the mortality rate is extremely high, but that the incidence is low.

SYMPTOMS

That the symptoms are often very indefinite and frequently missed is borne out by the fact

that of our 32 cases 16 were diagnosed as something else, 9 were sent in undiagnosed, and 7 were suspected of meningitis. There is, of course, no group of clinical findings peculiar to "influenzal" meningitis as distinct from other forms. In going over the histories of these cases one was impressed by the great variation in symptoms, as recorded in the different cases. Vomiting was mentioned in the largest number. Drowsiness, fever, irritability and convulsions were next in frequency. Twelve cases gave a history of convulsions. In none was the convulsion an initial symptom. In one case it occurred twenty-four hours after the onset and in the remaining cases from five days to five weeks after the onset. From the clinical standpoint this might suggest that basilar involvement at the beginning is the rule and that cortical involvement, when it occurs, tends to do so later. Our post-mortem findings do not however support this very strongly. In 10 of the 12 cases convulsions were followed by death in from one to five days. In the other two cases they lived 11 and 15 days, respectively, after the convulsions. Rapid breathing and shortness of

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CHART

In.	Date	Age	Spinal Fluid	Cell Count	Polymorph.	Lymphocytes	Blood Culture	Leukocytes	Primary or Secondary	Outcome	Autopsy
C.B.	Oct. 18/24	3 yrs.	B. Infl.	6,750	Per cent 94	Per cent 67	Negative	16,500	Primary, sore throat, meningial symptoms immediately.	Recovered Dec. 31/24	
J.L.	Oct. 25/24	1 yr.-2 wk.	B. Infl.	7,300	80	20	.....	41,400	Primary, meningial symptoms at onset.	Died, Oct. 26/24	
A.S.	Jan. 13/25	3 yrs.	?	.....	.....	..	.....	.....	? cold two days but not ill.	" Jan. 26/25	Broncho-pneumonia, fibrino-purulent exudate at base, also at cortex.
W.B.	Jan. 21/25	1 yr.	B. Infl.	2,700	88	12	Negative	29,000	? Cold for some time.	" Mar. 4/25	
D.H.	May 26/25	3 yrs.	B. Infl.	16,000	79	21	.....	14,000	Secondary, 4 days following cold.	" May 26/25	
J.T.	Sept. 28/25	4 yrs.	B. Infl.	9,070	76	24	.....	14,200	Secondary, 4 days following cold.	" Oct. 1/25	
A.B.	June 13/25	2 yrs.-2 mos.	B. Infl.	4,500	93	7	.....	17,500	? Cold for two weeks.	" June 22/25	
B.H.	Oct. 31/25	4 mos.	B. Infl.	2,400	81	19	Positive	3,000	Primary.	" Nov. 2/25	
F.P.	June 22/26	2½ yrs.	B. Infl.	1,890	56	44	.....	21,200	Secondary, 1 week after acute infection.	" June 26/26	
N.C.	Nov. 15/27	5 mos.	B. Infl.	6,500	85	15	.....	32,000	? Following cold, not sick.	" Nov. 29/27	
R.R.	Dec. 24/27	4 yrs.	B. Infl.	27,000	100	52	.....	.....	Primary.	" Dec. 24/27	
A.R.	Mar. 30/27	1 yr.	B. Infl.	2,700	48	..	.....	.....	? 2 weeks, following cold.	" Apr. 3/27	Exudate mostly on cortex. Small amount on upper portion of cerebellum.
J.R.	Mar. 24/27	19 mos.	B. Infl.	40,000	100	..	.....	16,800	? Head cold, not ill.	" Mar. 27/27	
G.P.	Jan. 2/28	18 mos.	B. Infl.	7,900	86	14	.....	.....	? Head cold, 5 weeks, not ill.	" Jan. 4/28	
I.L.	Mar. 27/28	6 yrs.	B. Infl.	12,400	98	2	.....	15,400	Primary.	" Apr. 2/28	
B.E.	Mar. 11/28	2½ yrs.	?	.....	.....	..	.....	11,400	Secondary, cervical adenitis, 1 week.	" Mar. 13/28	
J.K.	May 27/28	2 mos.	?	.....	.....	..	.....	11,200	Secondary, upper respiratory infection. 3-4 weeks.	" June 8/28	Exudate mostly marked over cerebrum.
S.R.	Oct. 9/28	2 yrs.	B. Infl.	3,200	100	80	.....	15,000	Primary.	" Oct. 13/28	
J.G.	Nov. 1/28	7 yrs.	B. Infl.	500	20	24	.....	16,000	Primary.	" Nov. 2/28	
A.M.	Nov. 13/28	4 yrs.	?	6,685	76	20	.....	18,000	Primary.	" Nov. 19/28	
E.J.	Jan. 19/29	6 wks.	?	850	80	20	Negative	27,200	Primary.	" Jan. 19/29	
E.T.	Apr. 5/29	6 mos.	B. Infl.	4,376	90	10	.....	58,600	Primary.	" Apr. 23/29	
B.J.	Apr. 6/29	8 mos.	B. Infl.	7,875	92	8	.....	17,000	Primary.	" Apr. 14/29	
M.C.	Oct. 13/29	6 mos.	B. Infl.	1,800	80	20	.....	10,400	Primary.	" Oct. 26/29	Exudate mostly marked at base. Also over rest of brain.
R.C.	Oct. 15/29	3 mos.	B. Infl.	10,800	65	35	.....	19,400	Primary.	" Oct. 17/29	
A.H.	Mar. 13/30	2¾ yrs.	B. Infl.	15,000	90	..	.....	.....	Primary.	" Mar. 15/30	
C.J.	Mar. 8/30	14 mos.	B. Infl.	2,250	98	2	.....	6,700	Secondary, cold.	" Mar. 17/30	
F.W.	Apr. 15/30	6 mos.	?	3,200	92	8	.....	13,200	Primary.	" Apr. 23/30	
E.K.	Sept. 22/30	2½ yrs.	.....	19,000	80	..	.....	.....	Primary.	" Sept. 23/30	
R.L.	May 1/31	20 mos.	B. Infl.	too many	100	..	Positive	26,000	? Head cold, 1 week.	" May 6/31	Exudate mostly at base.
L.W.	Apr. 27/31	2¼ yrs.	B. Infl.	16,000	100	..	Positive	5,300	Primary.	" May 13/31	Exudate mostly at base.
B.T.	Mar. 4/31	5½ yrs.	B. Infl.	4,000	90	..	Negative	13,400	Primary.	Recovered Apr. 22/31	

breath was also a very frequent symptom, being especially mentioned in 10 out of 32 cases. The frequency with which this led to a mistaken diagnosis of pneumonia was very noteworthy. Head retraction, stiff neck, pain in the head, and tenderness on handling were next in order. The tenderness on handling has seemed to me to be an important symptom and one that is probably much more frequent than the records suggest. It is probably often covered in the history under the term "irritability." Another point which was impressed upon one was the frequency with which the parents stated that the child seemed frightened and afraid to be left alone. The eyes were said to be normal in eighteen cases. There was photophobia in two, nystagmus in two, no reaction to light in two, sluggish reaction to light in two and internal strabismus in one.

The highest leukocyte count was 58,600 and the lowest 3,000. In all except 4 cases it was above 10,000, and in most there was a very definite leukocytosis. Kernig's sign was positive in 23 cases and negative in 9; Brudzinski's sign was positive in 11 cases and negative in 7, unrecorded in the other cases. The cell count in the cerebrospinal fluid ranged between 500 and 4000 per c.c. One case was recorded as having too many cells to be counted. In practically all the percentage of polymorphonuclear cells was high, although in four the lymphocytes were above 35 per cent, as seen in the Table briefly summarizing the cases.

We had 3 cases showing arthritis. The first subsided rather quickly without forming pus and did not have a positive blood culture; the other two both formed pus and both had positive blood cultures. The two agree with the common conception that the arthritic cases are associated with a septicæmia. Fitzgerald and Cohen² believe that these are different from either the meningitic or respiratory strains.

There were 9 cases under 1 year of age, 7 between one and two; 13 from two to four years; and only 3 cases above this age, the oldest being seven years.

It is strictly a disease of the spring and autumn. Cases occurred as follows:— 8 in March; 4 in April; 3 in May; 1 in June; 2 in September; 7 in October; 2 in November; 1 in December; 4 in January.

It will be noted that there is no real difference between the spring and autumn, there

being 16 cases in the spring months and 16 cases in the autumn months. October and March had the largest number of cases.

It was rather interesting, in view of Rivers' idea that most of the cases of influenzal meningitis are primary, that is, not secondary to an ordinary respiratory influenza, to analyze these cases from that standpoint. So far as we could judge from the histories 19 cases were primary in type. In these there was no history of head cold or illness until symptoms suggesting cerebral involvement were evident. We realize, and even suspect, that most of these cases would have some pharyngeal involvement for a day or two at least preceding the acute illness, but it has not been evident to the parents, or, at least, it was not mentioned in the history. In 8 cases there was a history of a head cold varying from a day or two to two or three weeks, but in which it was stated that the child did not seem feverish or ill, so that it was not in the nature of an ordinary influenzal attack. In 5 cases there was a history of an upper respiratory infection for several days preceding the onset of meningeal symptoms, so that, although the history in none of these cases was typical of an ordinary influenzal attack, we felt that they would have to be classed as secondary. It would appear, then, that in practically all of our cases the meningitis was not a complication of an ordinary respiratory influenzal attack. In most cases meningitic signs were present almost from the beginning. In a few there was a history of a mild respiratory infection for a few days and then symptoms of meningitis appeared.

AUTOPSIES

We only had 7 autopsies, and in these 5 showed the lesion to be most marked at the base, but with cortical involvement also; two showed the greatest involvement at the cortex, but showed basilar involvement as well. Our small number of cases would suggest that the lesion is most apt to be at the base, and, clinically, the time of onset of the convulsions would suggest that cortical involvement is more apt to come later. A brief summary of all these cases is seen in the table. We will cite specially only three or four cases because of their bearing on treatment.

CASE 1

B. T., male, aged 5½ years, was admitted to the Hospital for Sick Children on March 4, 1931. He had been perfectly well until March 3rd, when he developed a fever and vomited everything taken by mouth. He complained of pains all over the body and especially on the top of his head. It hurt him to move his right leg and he complained of light hurting his eyes. He was constipated.

Physical examination showed a stiff neck, very slight opisthotonos, photophobia, drowsiness. The pupils and ear drums were normal; no nasal discharge; no blockage of air passages. The tonsils had been removed; throat mildly infected; no rash. The lungs and heart were normal. The reflexes were slightly exaggerated; Babinski negative, Kernig marked. The cerebrospinal fluid was cloudy, purulent, showing Gram-negative bacilli and innumerable pus cells in the direct smear. Culturally these were influenza bacilli. The cell count was 4,000, showing 90 per cent polymorphonuclears. The white blood count was 13,400.

The mother was supposed to have had influenza two weeks previously, and as she was of the same blood group as the boy he was given a direct transfusion of 400 c.c. of her blood on the day of admission: 160 c.c. were saved for serum.

March 5th.—Drowsy; clinically much the same. Twenty-five c.c. of cerebrospinal fluid were withdrawn, which was cloudy, but the cell count had dropped from 4,000 the day previously to 900, with 90 per cent polymorphonuclears. The child was given 20 c.c. of the mother's serum intramuscularly.

March 6th.—Slightly worse, drowsy, headache; temperature 103° F., the neck and back stiff. Thirty c.c. of fluid were withdrawn; cell count 750. A continuous intravenous injection was started, using 5 per cent glucose with normal saline. Over 800 c.c. were given during the lumbar puncture and drainage. Twenty c.c. of the mother's serum was given intramuscularly.

March 8th.—Much brighter. Temperature down to 101°. Twenty c.c. of cloudy cerebrospinal fluid were drained; the cell count was now 350, with 90 per cent polymorphonuclears. The neck not so stiff. The boy was given 18 c.c. of his mother's serum.

March 9th.—Given 15 c.c. of his mother's serum.

March 10th.—Fifteen c.c. of cerebrospinal fluid was drained; it was only slightly cloudy, with a cell count of 160.

March 11th.—A little more drowsy. Temperature up to 102°. Twenty c.c. of fluid were drained; the cell count up to 335.

March 13th.—Given 20 c.c. more of convalescent serum. Another continuous intravenous injection of glucose and saline was started and discontinued next day. He received 2,450 c.c. of 5 per cent glucose and saline this time. Twenty c.c. of cerebrospinal fluid were drained, which showed a cell count of 851. A scanty growth of *B. influenzae* was obtained on culture after forty-eight hours.

March 14th to 24th.—The boy went through a period of ten days with a high swinging temperature, and his cell count had gone up to 2,000 and slightly above this. He was given 20 c.c. of serum every second day, except on one day when he was given a transfusion of 360 c.c. of blood from another supposed convalescent. He was lumbar punctured and drained daily. Despite the fact that his temperature was much higher during this period and the cell count had risen the boy seemed bright. His temperature gradually came down to normal after this. Clinically, he seemed perfectly normal. His cerebrospinal fluid on discharge, April 22nd, showed 120 cells mostly lymphocytes. No growth on culture. I saw the boy on May 15th, and could find no evidence of anything abnormal.

CASE 2

C. T., female, aged 3 years, was admitted to hospital on October 18, 1924. She had been perfectly well until October 16th. She cried continuously during that afternoon and complained of a headache and sore throat. She was very feverish and drowsy that evening and began to vomit at 2 a.m. on the morning of the 17th, and vomited everything ever since. She became delirious on the morning of the 17th, and had a convulsion at 9 a.m. She was hypersensitive and covered her face with the bed clothes. Physical examination showed a stiff neck and slight head retraction. She was delirious and very irritable, waking up at intervals of one-half hour or longer with a shrill cry. The knee and ankle jerks were difficult to elicit. The abdominal reflex was present on the right side, but not on the left. Kernig's sign positive; Babinski positive, and *tâche cerebrale* marked. Eyes normal; right ear normal; left drum membrane slightly congested. Throat red; tonsils large. Heart and lungs were normal. The white blood count was 16,500. The cerebrospinal fluid was cloudy; cell count 2,945, polymorphonuclears 78 per cent. *B. influenzae* on direct smear, confirmed on culture.

October 19th.—Twenty-five c.c. of cerebrospinal fluid were drained; cell count 6,750, 94 per cent polymorphonuclears. *B. influenzae* obtained on culture.

October 20th.—Fifteen c.c. cerebrospinal fluid were drained; cell count 3,611.

October 21st.—Exsanguinated 850 c.c. of blood; transfused 950 c.c.

October 22nd.—Drained 20 c.c. of cerebrospinal fluid; cell count 294.

October 23rd.—Drained 15 c.c. of cerebrospinal fluid; cell count 146.

October 24th.—Drained 30 c.c. of spinal fluid; cell count 110. No growth on culture.

Not much change was observable until October 27th, when an improvement was recorded. By November 10th the meningitic signs had disappeared. The temperature had come down to normal by October 27th. The child kept on improving, and by December 3rd the cell count was 8. She was discharged from hospital on December 31st, apparently perfectly well. I have had the public health nurses trace this case and they report that she is attending school, apparently quite normal.

CASE 3

M. L., female, aged 20 months, was admitted to hospital on May 1, 1931. She had been perfectly well until two weeks before, when she developed a chest cold and cough. This lasted one week but she was not very sick and she had completely recovered. Five days before admission she commenced vomiting and was feverish; two days later seemed irritable and stiff all over. She did not want to be lifted up and held her head on one side. She had taken very little food subsequently and became more feverish.

Physical examination revealed a very ill child with a piercing cry, who dreaded to be touched and held her head constantly to the right. The eyes and ears were negative, the fauces and tonsils distinctly injected. The right wrist was swollen. The white blood count was 26,000. Cerebrospinal fluid was purulent with too many cells to count; *B. influenzae* was grown on culture. Blood culture was also positive for *B. influenzae*.

The day after admission she was transfused with 210 c.c. of blood from a convalescent, and was also given 600 c.c. of glucose subcutaneously. On the third day she was given 20 c.c. of serum from a convalescent. The cerebrospinal fluid was so thick that it would hardly run and only one to two c.c. could be obtained. The child was given 600 c.c. of glucose subcutaneously until she died on the 6th day.

The autopsy showed the exudate to involve the cerebral cortex, but it was more extensive at the base. A thick layer of pus completely surrounded the medulla so that the cerebellum was separated from the base of

the skull and a cushion of pus surrounded the foramen magnum. There was an internal hydrocephalus, probably due to the circulation being cut off between the ventricles and the subarachnoid spaces of the cerebrum by the tight tentorium and the thick bed of pus around it.

CASE 4

L. W., female, aged 2¼ years was admitted to hospital on April 27, 1931. She had had a head cold for a week, but no cough or fever, and apparently felt none the worse for it. On April 26th she complained of severe pain in the back of the head and was feverish, and shortly afterward began vomiting, which had persisted; very drowsy.

On physical examination the child was dull and listless, irritable when roused. The pupils were sluggish to light. Ears, heart and lungs normal. There was a mild degree of pharyngitis present. Kernig's sign absent; dorsiflexion on plantar stimulation. White blood count 5,300. The cerebrospinal fluid was cloudy, with 16,000 cells, and gave *B. influenzae* on culture. Blood culture was positive for *B. influenzae*. Two days later a septic arthritis of the right elbow developed. This was drained later.

April 29th.—She was given a simple transfusion. The cell count dropped to 4,400 and on April 30th to 2,800.

May 1st.—The cell count had dropped to 1,000 and she was given another transfusion.

May 3rd.—Very much better. She continued to improve until May 10th, when she became worse. The temperature was high and the child was dull and listless. The cell count was going up with the proportion of lymphocytes increasing.

May 11th.—Transfused again. Signs of cortical irritation appearing; semiconscious.

May 12th.—A convulsion, and this recurred a little later, from which time she was convulsed more or less continuously until she died on May 13th.

At autopsy there was a heavy exudate at the base. The fibrino-purulent exudate surrounding the brain stem shut off the circulation between the posterior and middle fossæ. There was a subdural abscess over the right frontal lobe. There was a hydrocephalus of the communicating type, that is, there was communication from the lateral and 3rd ventricles through the aqueduct of Sylvius and the 4th ventricle to the cisterna magna, but the fluid was prevented from reaching the subarachnoid space over the cerebral cortex by the adhesions around the brain stem.

DISCUSSION

In case 1, as soon as influenzal meningitis was diagnosed, which was on the morning of the second day of his illness, a transfusion was given from the mother who was supposed to have had influenza two weeks previously. The rapid fall in the cell count in the cerebrospinal fluid from 4,000 on the day of admission to 900 the following day encouraged one to hope that some beneficial factor had been at work. It will be noted that in this case the treatment by transfusions and serum was intensive in the early stages. One felt that if any real benefit could accrue it must be before serious anatomical lesions had taken place. The continuous intravenous of glucose and saline with drainage by lumbar puncture was used with the idea of keeping the meninges flushed out as much as

possible. One realizes that care must be exercised in the use of this because of the danger of waterlogging the tissues or producing a pulmonary oedema.

In case 2 the exsanguination transfusion was not done with the expectation that it would have much effect upon the ultimate course of the disease. This, as you will have noted, was done several years ago and it was a surprise to everyone when the child recovered. It will again be noted, however, that on October 20th, the day before the exsanguination transfusion was performed, the cell count in the cerebrospinal fluid was 3,611. On October 22nd, the day after, it was 294. From then on the child made a much more spectacular recovery than did the first child. Here again we had a child who had only been ill a few days and one feels that the probability is that the donor was either a convalescent from influenza or one whose blood naturally contained a great many antibodies.

In case 3 the infection had gone considerably longer, and it will be noted that the cerebrospinal fluid from the first lumbar puncture was practically pure pus. This case would naturally appear to be most unfavourable for treatment.

In case 4, whether one could have prevented subdural abscess forming by more intensive treatment at the beginning is perhaps doubtful. One cannot help feeling that our treatment here was not nearly vigorous enough. This child improved so much that it was felt that she was going to get better anyway. At present, however, it serves to confirm one's idea that if anything can be done that it must be done early, before anatomical changes with a lot of pus in the spaces develop.

CONCLUSIONS

Influenzal meningitis tends to occur in infants and young children.

The seasonal incidence tends to be fairly evenly distributed between spring and autumn.

The use of convalescent serum, if given early and intensively before anatomical changes have had time to occur, together with glucose and saline intravenously and daily drainage by lumbar puncture, would seem to offer a hope of recovery for a certain number of cases. We feel that this should be given a trial until a specific serum can be developed.

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SOME DIFFERENCES IN THE ACTION OF EPHEDRINE AND EPINEPHRINE (ADRENALIN, ETC.) ON THE NASAL TURBINATE MUCOSA

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THESE substances are so frequently used by the medical profession and the opinion is so generally held that they are interchangeable that it is of importance to note a very definite difference in their action on the turbinate mucosa.

The appearance of the turbinate mucosa following the application of ephedrine has been described in various papers since 1925. The monograph by Chen and Schmidt in February, 1930, in *Medicine* summarizes these papers, and refers among others to observations by Fetterolf and Sponsler on the nasal reactions of ephedrine. They stated that, following the application of a 5 per cent solution to the anterior part of the lower turbinate by means of a cotton brush, "Contraction begins in from a few seconds to one minute. The maximum is established in from 1¼ to 5 minutes." "In spite of a small area of application the turbinate in every case contracts throughout its entire length." "The colour is altered to paler hue and assumes a gray tint at the maximum of the action. No white ischemia occurs as is often seen with epinephrine. Relaxation begins in 2 hours and 35 minutes and is complete in an average time of 3 hours and 17 minutes." "There is no secondary congestion as with epinephrine." The significance of this reaction produced by ephedrine on the nasal turbinate mucosa has not yet been mentioned, and it is for this reason that the following observations are recorded.

Descriptions of the minute circulation of the human turbinate leave much to be desired and for the practical purposes of this paper a diagram of a cat's turbinate (Figs. 1 and 2) is shown by kind permission of Dr. Piersol, Professor of Histology. The section is taken from a cat's turbinate after the vessels had been injected under pressure. It will be seen that all the large vessels are much stretched and Dr. Piersol considers that these may be called cavernous tissue. The capillaries are shown as the small vessels immediately beneath the epithelium. There are a few deep capillaries injected in Fig. 2, which shows that all capillaries, both deep

and superficial, have been filled with the fluid. This brief description is sufficient to explain the various points of interest to be discussed without going into too much detail.

The following simple experiment gives the basis for the conclusions in this paper.

A cotton applicator is moistened in ephedrine watery solution (3 per cent) and applied to the inferior turbinate over an area of a few mm. with as little pressure as possible. A similar application of adrenalin (epinephrine; epinin), of ordinary commercial strength, is made to the inferior turbinate of the opposite side and the

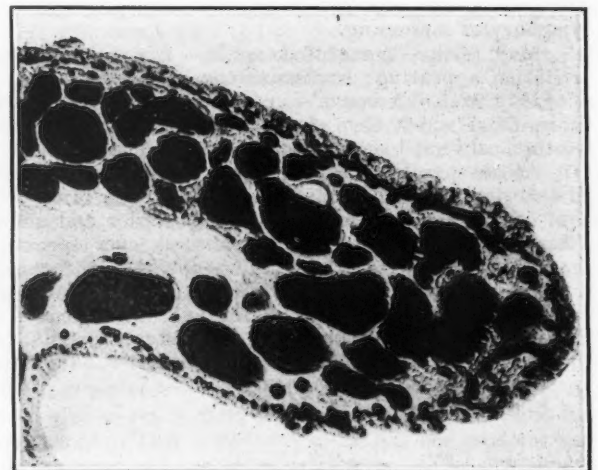


FIG. 1

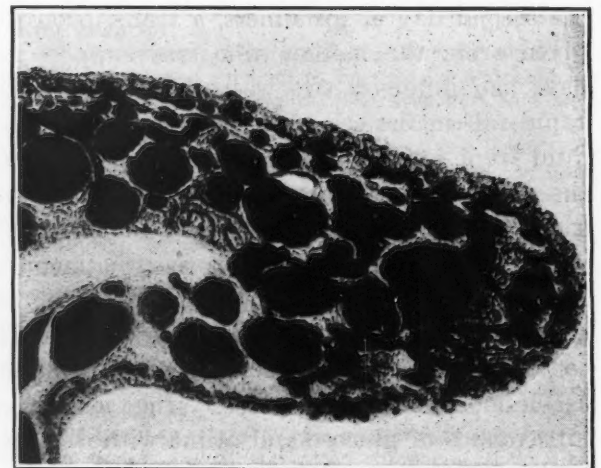


FIG. 2

two compared. In a few seconds the turbinate mucosa to which ephedrine has been applied will begin to shrink until it is as thin as that to which epinephrine has been applied. There is, however, this difference. On the ephedrine side the mucosa retains a pinker shade but may show the following variations. (1) The usual normal redness with colour is little affected; (2) a mottled appearance of reddish and paler areas appears after the shrinking has taken place. The turbinate tissue shrinks *before* any of the above reactions take place. On the other hand the turbinate to which epinephrine has been applied shows (1) paleness, rapidly developing into a blanched appearance, *followed* by (2) shrinking of the mucosa over a corresponding area.

The mottled area which appears after ephedrine has been applied and the cavernous tissue shrunken is due to a final almost complete contraction of the larger vessels beneath the mottled surface. Some are contracted more than others and thus the mottling is explained. The significance of this reaction is worthy of comment since it is a demonstration that the cavernous tissue of the nose can act independently of the capillaries. The latter may be only secondarily affected in a mechanical way from lack of blood flow. This also goes to prove that influences which may cause the cavernous tissue to react may have no direct effect on the capillaries. This principle in turn suggests that the size of the turbinate, for instance the intumescent turbinate, is due to irritation and a lack of tone in the cavernous tissue. It is produced by internal or external influences affecting the muscle of the vessel walls, either directly or through the sympathetic nerves which supply them. A lack of balance in the sympathetic nervous system may be conceivably shown by this intumescent turbinate. It is often present at the time of puberty. On the other hand external irritants, such as those present in hay fever, some cases of asthma, and many other conditions may be responsible for a lack of balance between contractile and dilatory control of the cavernous turbinate tissue.

An interesting reaction recently observed was one in which the converse of the above was demonstrated. A patient who had suffered from a vasomotor rhinitis for ten years came under observation. The turbinate mucosa was greatly swollen and a similar condition of the septal mucosa was present. The nasal cavity was obstructed, completely interfering with respiration. Although this mucosa was greatly swollen

yet it was as pale as white skin. On application of ephedrine the cavernous tissue of the turbinate shrank as in the former experiment, but the capillaries and minute vessels dilated and became filled with blood, as shown by the normal pinkish-red colour which appeared. Evidently then, we have additional proof that cavernous tissue and capillaries react independently. The larger septal vessels followed the same rule as the cavernous tissue, the minute vessels and capillaries dilating with a resulting pinkish-red colour, although the thickness of the mucosa had slightly diminished.

This subject, one feels, could be followed along these lines with much profit, but in this paper we are dealing with the reactions of ephedrine only, and the intumescent turbinate is mentioned for the purpose of calling attention to the possibilities of more intelligent treatment of the nose as we more accurately understand some of the reactions of the mucosa and become more 'circulatory' and less 'mechanically minded.' With the intumescent turbinate for instance, we should search for the cause of the irritation, but treatment of the turbinate should be instituted rather than injury by operation.

A further reaction of ephedrine, referred to by Fetterolf and Sponsler, may now be briefly mentioned. It concerns the widespread area of cavernous tissue which is affected after application of ephedrine to a small surface of the inferior turbinate. They state that shrinking extended along its whole length. To the writer the extent and rapidity of this effect following such a small dose of ephedrine suggest that this reaction is a nervous one. This conclusion in turn is of significance in the treatment of nasal conditions. It is legitimate to infer that the contractility of nasal vessels may be influenced as a point distant to the direct application of the drug. Here again is a field for observation. On the application of epinephrine to the nose a purely local blanching and shrinking is obtained.

The lack of unpleasant reactions after the use of ephedrine is probably due to the fact that the capillary vessels are not directly acted upon by ephedrine, while Sir T. Lewis tells us that in the case of adrenalin its action is directly upon the capillary walls. There is a difference of opinion regarding the latter statement, but, judging by the reaction described above, it is at least one factor in the marked disturbance often experienced in the nose following the use of adrenalin (epinephrine, etc.).

In conclusion, the suitability of using ephedrine

or adrenalin with cocaine for local anæsthesia may now be decided. If ephedrine is used, the capillary circulation is open for a time at least with blood flowing freely through these channels. The cocaine is therefore more likely to be absorbed than when adrenalin is substituted. In the latter case the capillaries are closed off as soon as the solution begins to be absorbed, and there is less possibility of cocaine absorption into the circulation.

CONCLUSIONS

1. The cavernous tissue of the nose may act independently of the capillaries and vice versa.
2. Some influences which cause the intumescent turbinate should be kept in mind.
3. When cocaine solutions are employed for local anæsthesia, the suprarenal gland extracts (epinephrine, etc.), or their equivalents, are a wiser choice for limiting absorption than is ephedrine.

THE NECESSITY FOR EARLY TREATMENT OF STRABISMUS*

BY WALTER W. WRIGHT, M.B.

Toronto

NORMAL eyes will both fixate the same object, *i.e.*, they will be "straight," and this is true not only when both eyes are open but when one is covered. This condition is called "orthophoria." When both eyes look straight at an object, when both are uncovered but one or the other eye will deviate under cover, we have a derangement of binocular fixation known as "heterophoria," and according to whether the eye tends to turn in, out, or up under cover we have the various subdivisions of esophoria, exophoria and hyperphoria. Heterophoria is a latent strabismus, and is present, at least to a very slight extent, in a very high percentage of people. On the other hand, when only one eye fixes an object and the other deviates, even with both eyes open, we have the condition known as squint, strabismus or heterotropia. The latter term has, during recent years, at least on this continent, come into very general use and is to be preferred, as the heterophorias and heterotropias are very closely related to each other. Heterotropia, like heterophoria, is divisible into esotropia, exotropia and hypertropia.

As esotropia or convergent strabismus is much the commonest and most important of these conditions, my remarks in this paper will be largely confined to it, although much of what will be said is applicable directly or conversely to hypertropia and exotropia.

The ideal treatment of any pathological condition is to restore the part to normal, both in regard to appearance and function. This in the case of a heterotropia means not only that the two eyes should be apparently straight (a good

cosmetic result), and not only that both eyes should have good vision, but that we should have as well binocular vision (a good functional result). This is, I realize, a high ideal at which to aim, and is unfortunately not obtainable in every case, but I believe that it is obtainable in the vast majority of cases, provided always that the case comes under the care of the oculist very early in its course. In this connection, I was very pleased to see this point stressed in two recent papers in the *Archives of Ophthalmology*. Barkan *et al.*, in reporting their cases operated on by the O'Connor cinch operation, classified their results according to age, binocular fixation, and the degree of fusion. In the age group 1 to 7, 84 per cent showed at least the first degree of fusion, whereas in the group 10 to 30 there were only 37 per cent. If the cases treated without operation were considered the contrast would of course be much greater. Again, Luther Peter, in a paper read before the New York Academy of Medicine, said "In monocular squint one no longer hopes for cosmetic results; singular binocular vision is the goal."

A number of years of experience in the treatment of strabismus has led me to the conclusion that early treatment is the one most important factor in obtaining good results, but, in order to see the cases early, we must have the cooperation of the general practitioner and the pædiatrician, as it is by them that the child is usually first seen.

Let us now consider why early treatment is so important in obtaining good results. This can, I think, be done best by approaching the subject from the point of view of, firstly, etiology, and secondly, effects.

* Read before the Section of Ophthalmology, Academy of Medicine, Toronto, April 11, 1932.

ETIOLOGY

I do not propose to enter into a discussion of the relative merits of the various theories of the causes of esotropia but rather to consider only the more generally accepted theories in so far as they throw any light on our present subject of early treatment.

(a) *The accommodation theory of Donders.*—When two normal eyes are fixed on a distant object both accommodation and convergence are at rest. The closer the object is brought to the eyes the greater becomes both the accommodation and the convergence. These two functions, being always performed together, are associated. We can consider them analogous to conjugate muscles. Their centres are very closely related, and a similar degree of stimulus travels down the third nerves to the ciliary muscles in the case of accommodation, and to the internal recti in convergence. Now to the hypermetropic eye in a state of rest all objects, even distant ones, are out of focus, but just as the normal eye can focus on close objects by the power of accommodation so can the hypermetropic eye use the same power to overcome its hypermetropia and thus see objects clearly. In other words, the hypermetrope is using some of his accommodation even to see distant objects, and when he comes to fix a close object he has to use this amount plus the amount that a normal eye needs. The result is that he has to send a very strong stimulus to his accommodation. Now as we have said that the accommodation and convergence are very closely associated, the tendency in sending this strong stimulus to accommodation is at the same time to send too strong a stimulus to convergence with the result that the eyes over-converge, so that neither eye fixes the object. The next step is for both eyes to rotate to the right or to the left so that one eye fixes the object and the other is turned in, and we almost invariably find that the young patient chooses the better eye to fix the object, or, to put it another way, that the squinting eye almost invariably shows a higher degree of hypermetropia or astigmatism. (Where the refractive error is equal in the two eyes we are likely to get the alternating type of strabismus.)

This convergence excess does not develop suddenly into a constant esotropia. What usually happens is that somewhere between two and four years, *i.e.*, when the child is starting to fix on close objects, the observant mother or nurse notices that one eye turns in. This is at first

frequently noticed only at meal time and at this stage one can at times get from a bright child a history of seeing double. Whether one can get a history of diplopia or not, I believe it is always present at first. This stage of spasmodic esotropia usually lasts for several weeks and in rare instances even for years. It is during this stage that we have the ideal time for treatment, *i.e.*, before the esotropia becomes constant and the child learns to suppress the image of one eye. The treatment then consists of fully correcting the hypermetropia with glasses and thus getting rid of the underlying stimulus to over-converge. Glasses can be worn satisfactorily by a child a year old. Dr. Bennett, of Buffalo, says "No child is too young to wear glasses if needed" and with this statement I heartily concur—in fact I would go further and add "or to be operated on, if indicated."

(b) *The fusion theory of Worth.*—Referring to Donders, Worth said "The great physiologist let the first ray of light into this dark corner of ophthalmology and gave the first indication for a rational treatment of convergent squint. But he was mistaken in supposing hypermetropia to be the fundamental cause of the malady." In brief, Worth considered the essential cause of squint to be a defect (not necessarily an absence) of the fusion faculty. In the presence of this fundamental cause the eyes are in a state of unstable equilibrium, ready to squint on slight provocation. This provocation may be supplied by a number of conditions, chief of which is hypermetropia. At any rate, whether or not we consider a defect of the fusion sense the fundamental cause, binocular vision is dependent on the ability of the two eyes to fuse their respective images and Worth has demonstrated that between the ages of three and five is the best time to develop this sense, and that after six years of age it is seldom worth while to attempt fusion training. So from the point of view of fusion we have another reason for early treatment.

(c) *Nervous instability.*—In more recent years the feeling has grown that, although Donders' and Worth's theories are important factors in the causation of esotropia, there is a further underlying factor. Duane, to whose work we owe a great deal of our present knowledge of strabismus, believed that an esotropia usually develops out of a simple convergence excess to which is added a divergence insufficiency, and he stated "The processes by which these changes take place are doubtless central, following, as Hoffmann pointed

out, the law promulgated by Sherrington, that excessive stimulation of the centre for one movement produces inhibition of the centre for the opposing movement." In other words, in cases of convergence-excess the centre for convergent movement, being subjected to continuous overstimulation, becomes more and more active, producing a continually greater excess of convergence action and at the same time causing greater and greater inhibition of the centre for the divergent movements. Along the same line, Barkan in the paper previously referred to says, "To our mind, Sherrington's law of reciprocal innervation might with benefit be applied to the neuromuscular apparatus of the eye in cases of squint . . . observations by O'Connor and our own researches have confirmed us in our belief that strabismus of relatively recent origin is in the nature of a habit spasm, that is, contraction and relaxation. According to Sherrington's law, such a contraction and relaxation would be inclined to persist and the longer it remained the greater would be its tendency to perpetuate itself." Further on in the same paper he says—"By operation the habit impulse is interrupted and the eyes are placed in a position that closely approaches parallelism." A little further he says "It has been our practice to operate irrespective of age, as soon as it can be determined that orthoptic treatment and glasses will not remedy the deviation." The conclusions in regard to early treatment to be drawn from these quotations are I think obvious.

(d) *Vertical imbalance as an etiological factor.*—When a child has a congenital vertical deviation (usually due to a congenital paresis of the superior rectus) it sometimes overcomes the annoying diplopia by tilting the head to bring the images on the same level. Far more often, though, I believe, the child, being unable to fuse the images, learns to overcome the confusion by letting one eye turn in or out, thus widely separating the images and then, as in the ordinary cases, learns to suppress one image. Since examining for vertical imbalance as a routine I have been surprised at the number of cases of esotropia (frequently those without much hypermetropia) that show a vertical imbalance. I have now little doubt that this is a much more frequent cause than we have previously thought, and also that failure to recognize it explains a certain number of our failures in treatment. As Duane said, "That this is the cause of the lateral squint in these cases is proved by the fact that in some

of them, particularly before the lateral deviation has become inveterate, the latter disappears when the vertical deviation is relieved by an operation." Here again early treatment is obviously indicated.

EFFECTS

(a) *Effects on the muscles.*—In the early days a congenital or acquired defect in one of the muscles of the eye—either a weakness of the external rectus or an overpowerful internal rectus—was looked on as the cause of esotropia, and, although a small proportion of cases are due to such defects, it is now generally recognized that weakened external recti and shortened internal recti are in the vast majority of cases the result, rather than the cause, of the esotropia. It is a matter of common observation that in the early stages the outward excursion of the eyes is normal. Another significant common observation is that the eyes usually become straight under an anæsthetic. On the other hand, it is only natural if an eye is turned in for years that from the constant stretching the external rectus should become thinned, weak, and more or less atrophic, and that the internal rectus should become shortened. We have all had the experience of finding these conditions in long standing cases and know the increased difficulty in getting good results. Why then wait until this late stage?

(b) *Amblyopia ex anopsia.*—As its name implies, amblyopia ex anopsia is blurred vision of the eye from disuse. When an adult develops a strabismus he suffers from a very distressing diplopia which may last for months or even years before he learns to ignore or suppress the image of the non-fixing eye. A child on the other hand very readily learns to suppress the image of one eye and from the time this suppression starts the vision steadily deteriorates, except of course in the case of the alternating squint where the function is maintained because sometimes one and sometimes the other eye is used.

From a study of these cases a number of very interesting and instructive observations have been made. The loss of vision has, for example, been found to largely affect the central or macular area, leaving the peripheral field intact. Again it was found that the earlier in life the suppression starts the more rapid is its progress and the greater its degree. An infant under a year old may lose the power of central fixation in a few weeks—at three years of age it may take a year and after four years of age the amblyopia rarely progresses to the extent of loss

of central fixation, although it may drop below 6/60.

As amblyopia develops from disuse we would expect to restore the vision by making the child use the eye. This is indeed the case, but here again some interesting observations have been made, especially as to our limitations in restoring the vision to normal. Generally speaking, the longer the suppression has been present and the more profound the degree of amblyopia, the more difficult it is to restore the visual function to normal. Here again the age factor is an important one. The younger the child the shorter is the period of suppression necessary to do irreparable damage. From his vast experience Worth formulated as a general working rule that "if a child has had a constant unilateral squint for half of its life, there is not much use in trying to restore the vision." This rule we have found to work out very well in practice, although once in a while we get surprisingly good results when not expected, so that one feels that an effort should be made in every case, no matter how hopeless. However, in a child, say three years of age who has had suppression for two years, if two or three periods of total occlusion of the good eye for ten days have not restored fixation there is little use in persevering. Again in any case with a marked degree of amblyopia one gets so little improvement after the age of six, or at least seven, that it is questionable whether it is worth while when one considers the annoyance and discomfort to the patient. The practical point here is that if the case is allowed to go until advised treatment by the school doctor it is already too late in most cases to restore the vision to normal.

These observations about amblyopia ex anopsia add a further very powerful argument in favour of early treatment.

(c) *Morale*.—The third effect that I will discuss very briefly is the effect on the child's morale. A cross-eyed child, when it gets to the school age, is liable, especially if a girl, to develop a reaction of physical insufficiency, or, to use the more hackneyed expression, an inferiority-complex, which may change the whole course of its life. On the other hand I have noticed at times,

and here especially in boys, a tendency to develop a scrappy, pugnacious manner in their contact with other children. This may be so marked that the boy may be classed as a bully. The psychologist would, I fancy, explain this reaction as a compensating one, *i.e.*, a reaction to an earlier sense of physical insufficiency. This effect on the child's morale is, I believe, a sufficient reason in itself for early operation, and, further, I have found it an argument, when urging operation, that seems to appeal to the parents.

So much for the arguments in favour of early treatment. What is to be said on the other side of the question. There is the old idea that "they will grow out of it." While it is true that a certain percentage of cases do show a tendency for the eyes to straighten as they grow older, they do so at the cost of the useful sight of one eye. Our experience during the war, when literally thousands of men were found ineligible for military service because of poor sight in one eye associated with a history of cross-eye in childhood, was quite sufficient in itself to end this wait-and-see attitude with its appalling economic results. Again, there is the argument, especially prevalent on the continent, that operation should be postponed until it can be done under a local anæsthetic, as then the relative position of the eyes can be tested as the sutures are tightened. If the case has advanced to a state where amblyopia is permanently established and where the operation is only for cosmetic purposes this point is worthy of consideration, but in the centres where this idea is in vogue they do not seem to have realized the possibilities of early treatment in restoring full normal function.

In conclusion, let me say that during the past ten years there has been a marked improvement in our results at the Hospital for Sick Children, due largely, I believe, to our seeing the cases at an earlier stage; but, in order to approach the ideal of one hundred per cent efficiency, we must see a far higher percentage of cases in the early stages and, as I said earlier, to do this we need the cooperation of the general practitioner and the pædiatrician.

Case Reports

FRAGILITAS OSSIUM AND BLUE SCLEROTICS

By H. S. SHARPE,
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Recently a young lady, a school teacher, was seen, stating she had sustained a fracture of her right humerus, but not due to any violence. Examination of the arm showed a fracture at the junction of the upper and middle third, with some over-riding of the fragments. Ten days previously, when about to stumble over the edge of a platform, she caught a curtain with her right hand, and the arm sustained a slight twist. No pain was present, but she felt that something had happened and kept her arm by her side. She continued her school duties, but on the day she presented herself for treatment she felt something displace in her arm as she raised it from her side. Under local anaesthesia the fracture was readily reduced, and the arm placed on a triangular splint. Good union resulted.

This was the fifth fracture the patient had sustained, and all were due to slight trauma. Three of the fractures occurred before the age of fourteen years. On enquiry into her early history she stated she did not walk until the age of five. She wore steel braces to support the legs from the age of five to nine years. At the age of fourteen she was treated for scoliosis and wore a cast for six months.

Her eyes exhibited the typical blue sclerotics of fragilitas ossium. Her father also had the same pigmentary defect and had sustained many fractures. One brother, she reports, has eyes like hers, and has had three fractures. No other members of the family or their antecedents have had blue sclerotics or fragile bones.

A radiograph of the head showed some tendency to thickened islands of bone in the vault and wide suture lines. The radiograph of the long bones showed the cortex to be thin and dense and the medullary cavity comparatively large.

RUPTURE OF THE INNER BELLY OF THE GASTROCNEMIUS AT THE TENDO ACHILLIS

By WALTER P. HOGARTH, M.B., F.A.C.S.,
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Complete rupture of the tendo Achillis is not a frequent, yet not an uncommon accident, but a rupture of the internal belly of the gastrocnemius muscle from its insertion seems to be a rarity. I am led to submit the following history because it is the first case of the kind to occur in our hospital here, though much traumatic surgery is seen; and also, because outside surgeons with much experience have stated, in personal communications, that they have not seen this condition.

R. C., an elevator employee, aged 55, in pursuit of his usual duties, was helping to unload a car of wheat. For this purpose a scoop about three feet square is used. To this is attached a cable near its centre. It was his duty to pull this grain scoop back in the car and keep it balanced while it was drawn to the car door by means of the cable. It will be seen that it would be necessary for the operator to use considerable force to maintain the balance of this scoop as it was drawn through the grain. R. C. had taken this scoop to the end of a car which held about five feet of wheat. He was thus up to his thighs in the grain and did not have a solid footing. As the scoop was drawn out it was necessary for him to lift against it. He had stepped forward with his left foot and was still pushing the scoop, when just as he was starting to move his right leg he felt something snap in his right calf and could not move the leg. I saw him about 30 minutes later. He was in considerable pain and walked using the right heel. He was admitted to McKellar Hospital and examined several times during the day. His pain was definitely localized by palpation and manipulation to a small area at the base of the calf on the inner side. There was no discoloration of the skin, no swelling, nor increased measurement. He could not extend the foot and manipulation increased his pain. The tendo Achillis was intact; its tension

was markedly less than that of the left side. Gentle palpation gave the impression of a slight gap in the muscle at its attachment to the tendon. With some trepidation a diagnosis of rupture of the attachment was made.

An operation was performed the next day. A longitudinal incision was made over the muscle and tendo Achillis. The subcutaneous tissues were retracted, revealing the sheath of the muscle to be intact. Manipulation of the foot showed that the outer belly of the gastrocnemius was intact but there was no movement of the inner belly. A small amount of fluid could be detected under the sheath. The sheath was opened and about two drachms of blood-tinged fluid evacuated. The muscle was found to be torn from its attachment to the tendon, with a few frayed ends of the tendon on its posterior surface. The gap was one and a half inches long. The frayed ends were secured, and, with the foot in extreme equinus position, the torn ends could be approximated and sutured. The wound was closed and the leg put up in a plaster cast with the knee flexed and the foot in equinus.

The post-operative course was uneventful; the patient returning to work in three months with excellent function.

CUTANEOUS LEUKOPLAKIA FOLLOWING AN OLD ANAL PRURITUS

BY ALBÉRIC MARIN,

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M. R., aged 65 years, came to the Dermatology and Syphilology Clinic at Notre Dame Hospital, on January 21, 1932, complaining of itching of the anus and scrotum of some twenty years' standing.

He was found to be suffering from a severe pruritus of the anus and surrounding tissues, and of the scrotum, giving rise to an uncontrollable desire to scratch the parts. When the impulse made itself felt, wherever he might happen to be at the time, he must yield to it and scratch himself. These severe attacks occurred 7 or 8 times a day, and during the night; he was unable to sleep, work, or appear in public; the attacks left him exhausted. He was restless, depressed and discouraged. The

incessant scratching caused a semilunar wearing-down of his nails. He had been in this condition for about 20 years.

Examination revealed the fact that there was considerable alteration in the parts affected. The skin, from the upper fold of the buttocks to the middle third of the scrotum, was altered as regards appearance, texture and colour. The tegument was glossy, whitish and thickened, but not verrucous. The pores and folds of the skin were obliterated. The skin was atrophied, shiny and taut, showing, here and there, bright red scraped patches. There was a slight serous exudate. This alteration shaded off, little by little, towards the edges, where there was desquamation. On the left buttock, near the margin of the anus, there was an irregular, but not indurated, ulcer with ragged edges, 3 centimetres in diameter, cut out as if with a knife in a roughened and whitish zone about 0.5 centimetres deep. The floor of this ulcer was smooth and the colour of flesh. Here and there there was evidence of excoriations caused by the almost constant scratching. There was no inguinal or crural adenitis.

The condition recalled the appearance of a leukoplakia of the mucous membrane of the mouth, whence we have derived the name of cutaneous leukoplakia, that we have given to this particular case. A biopsy of the edges of the ulcer revealed a sclero-hyperplastic condition, without any epitheliomatous degeneration. This condition had gradually formed under the influence of the chronic irritation of the traumatism resulting from the continuous scratching.

The patient showed no leukoplakia of the mouth, nor had he a venereal history. His Wassermann test was negative and glycaemia was normal. He had not suffered from chronic constipation or from intestinal worms. There were no hæmorrhoids, fissures or fistulæ.

He was given treatments of x-rays (dosage, $\frac{1}{4}$ skin unit unfiltered, per week). He experienced marked relief ever since the first irradiation. After three months' treatment, the pruritus had practically disappeared. The appearance of the ulcer was not changed. It is our intention to institute electrodesiccation before the condition assumes a possible malignity.

We believe that our observations on this case

are of a certain interest in view of the extreme rarity of this type of leukoplakia of the skin (we have never seen a case of this type reported), and on account of the manifest action of radiotherapy on anal pruritus.

It is not perhaps out of place to add that the miserable existence which this man is dragging

out and the danger of cancer with which he is threatened might have been avoided had radiotherapy been employed earlier, since, at the present time, radiotherapy is the only effectual treatment for any anal, scrotal or vulvar pruritus (*sine materia*) which persistently resists all other treatment.

Clinical and Laboratory Notes

A CONVENIENT SOURCE OF WOOD'S LIGHT FOR THE DIAGNOSIS OF RINGWORM OF THE SCALP*

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In 1925 Margarot and Devèze discovered that hairs infected with fungi belonging to the genus *Microsporon*, when examined in the dark with ultra-violet light, fluoresce with a green light which is quite distinct from the fluorescent colour of the normal hair and skin. A similar fluorescence was observed in hairs from cases of favus. Since the original communication by these observers, the test of fluorescence in the so-called "Wood's light" has been more or less widely applied in the diagnosis of ringworm of the scalp. Undoubtedly the best source of ultra-violet rays for the purpose consists of a water-cooled quartz mercury-arc lamp, fitted with Wood's glass or some other filter capable of absorbing most of the visible light but transmitting the longer ultra-violet rays. This apparatus has several limitations, and a need has been felt for an inexpensive, light, portable lamp that can be plugged into any lighting circuit. Such a lamp has been produced after tests of several types of filter and sources of light. No claim to perfection is made for the design of the lamp, and, no doubt, one can be made both smaller and lighter than that described below.

The light source employed consists of a Mazda "Photoflood" lamp. This a high intensity lamp designed primarily for photographic work, and having a life at 115 volts of about two hours. The price is similar to that of an ordinary electric bulb. Tests with

various ordinary long-lived lamps of high wattage, including a 500-watt projection lamp proved them to be deficient in ultra-violet radiation, and infected hairs could scarcely be differentiated from normal ones by their use.

Two thicknesses of 3/16 in. Corning Heat Resistant Red Purple Ultra glass No. 587 are used as a filter. In order to avoid overheating, the filters are placed at a distance of about 4 in. in front of the light. On the outside of the filter a plano-convex condensing lens is placed, in order to produce a concentrated beam at a convenient working distance of 4 to 6 inches in front of the lamp house. It is not necessary to use a quartz lens, as apparently glass adequately transmits the long wave ultra-violet radiations which are effective in exciting the fluorescence.

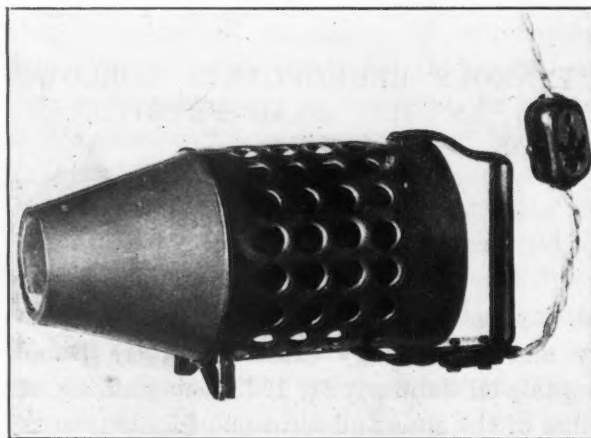


Fig. 1

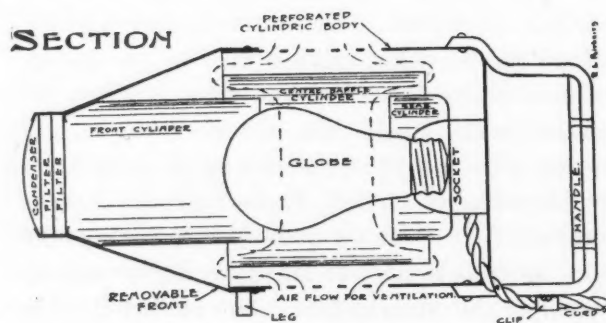


Fig. 2

* This work was made possible by a grant from the Banting Research Foundation, Toronto.

The lamp house consists of a metal cylinder pierced with holes for ventilation and suitably baffled to prevent the escape of stray light into the darkened room. The lens and filters are mounted on a removable conical metal front. A handle is provided at the back to allow the lamp to be held in any position during examination of a scalp. The over-all length of the lamp is 12 inches and the weight about 2 lb.

The lamp is used in a darkened room by turning the beam of faint violet light upon the areas of the scalp where ringworm or favus is suspected. Patches, and even single hairs, infected with *Microsporon audouini*, *Microsporon lanosum* and *Achorion schoenleinii* emit a bluish green light, contrasting strongly with the dark colour of normal, uninfected hairs.

The fluorescence test is not infallible, and in the diagnosis of ringworm the following limitations must be borne in mind. So far as the experience of the writers extends, species of *Trichophyton* have not been observed to cause the green fluorescence of infected hairs. A case should not therefore be reported as negative for ringworm fungi upon the fluorescence test alone. This fact will not materially reduce the usefulness of the test, as only a small proportion of the cases of tinea capitis in this country appear to be caused by *Trichophyton sp.*, the great majority of cases being caused by species of *Microsporon*. Tinea barbæ, which is usually a *Trichophyton* infection, therefore, will not give the fluorescence test. A faint bluish white fluorescence is sometimes noted from uninfected white hairs. However, as the vast majority of patients suffering from tinea capitis are children, error from this cause is not likely to occur.

The rapidity with which contacts can be examined and the progress of patients checked during treatment by use of the green fluorescence test is of great advantage. The parents of the children are often stimulated to cooperate in the treatment with greater enthusiasm when they are given such a striking demonstration of the disease.

TANDEM FIT SURCULUS ARBOR

How small soe'er your profit be
 Despise it not, but learn to know
 That almost ev'ry thing you see
 From small at first to large did grow;
 Do but a little oft, and you
 Will find that little grow apace;
 The penny to the pound accrue,
 And "Slow and sure oft win the race."

—Pigot.

A REPORT ON THE TREATMENT OF TWELVE CASES OF PSORIASIS WITH NEO-SALVARSAN

By J. J. ROBERTSON, B.A., M.D., C.M.,
 F.A.C.S., AND

R. CHARLES ADAMS, M.D., C.M.,
 Belleville, Ont.

In a series of twelve cases of psoriasis, treated by us during the past three years we have received such uniformly good results from the use of intravenous arsenic in the form of neo-salvarsan that we consider a report of these cases will be of interest.

Until three years ago we had been using arsenic in the form of liquor arsenicalis, together with various ointments, and had achieved only indifferent results. Some cases yielded to treatment, while others were only slightly improved or remained unimproved. About this time we started treating a patient for syphilis, who also had psoriasis, and noted that after six intravenous injections of neo-salvarsan the rash had practically disappeared. It was then that we started using neo-salvarsan on all our cases with most satisfactory results. The following is a report of two of these cases.

Mr. C. came to us with numerous patches on the arms, legs and body, which had been present for the last ten years. We started giving him neo-salvarsan, 0.45 grm., at weekly intervals. At the end of three injections the rash had faded noticeably, and at the end of ten injections had completely disappeared. He has had no recurrence in one and a half years.

Mr. K. had a patch around the umbilicus about six inches in diameter, of two years' duration, which had resisted previous treatment. We gave him the same course (ten injections of neo-salvarsan, 0.45 grm.) over a period of two and a half months. The patch completely disappeared at the end of this time, with no recurrence up to one year after.

The results in the other ten cases have been equally good; many of them had resisted arsenic in other forms and various kinds of ointment. Together with neo-salvarsan, we have also used ultra-violet light therapy and a mixture of chrysarobin ointment, ammoniated mercury ointment and zinc oxide ointment, in equal parts, but cannot lay a great percentage of the cure to these agents as we had tried them many times before with indifferent results.

Editorial

TRENDS IN DISEASE

IT is a fact, well accepted by the profession, that the incidence of disease is rarely a fixed quantity. During the past thirty years the diseases due to infectious agents have manifested a notable decrease in their ravages, mainly owing to the discovery of specific vaccines and antitoxins and the institution of better hygienic precautions; on the other hand, those diseases associated with the stress of life, cardiovascular affections, insanity, for example, seem to be increasing; and cancer, almost certainly, is much more prevalent than formerly. But besides these general trends there are modifications, both in the case of epidemic and endemic diseases, which are dependent on other factors, such as climate, seasonal peculiarities and locality. There are still others that are harder to explain, such as the variations in virulence which are manifested from year to year by measles, scarlatina, smallpox, diphtheria, pneumonia, influenza, and typhoid fever. Possibly here we have to postulate an increase in virulence of the causative agent, or an alteration in the degree of resistance inherent in the population affected, or both. These are generalities, accepted as true, but based largely on impressions and experiences and more or less vulnerable statistical records. It has been a custom to scoff at statistics. We all remember the old gibe—that there are three grades of falsehood, lies, damn lies, and statistics. And, indeed, figures may be made to prove almost anything. There is a mathematical curiosity, we remember, in which, by calculation, it can be shown that $1=0$. However, things are now better in the matter of statistics, and some, notably those referring to death and disease, are marvels of painstaking care and analytical acumen. From such we can learn much. We have in mind here, in particular, the Registrar-General's Statistical Review of England and Wales for the Year 1930. From this it is possible to follow accurately the trends manifested by the public health during a number of years.

One of the first things to be noted is that the death rate has remained remarkably uniform during the last three-quarters of any year. During the last ten years the average mortality in this period has fluctuated by less than one per thousand. It is quite different in the case of the first three months of the year. Here the death rate has ranged between 13.2 and 20.9 per 1,000. It would appear from this that, should this condition prove constant, the mortality for the first three months of any year will determine, in the main, the rate for the whole year. Thus, in the case of 1930, the mild weather in the first quarter of the year, together with the absence of influenza, combined to produce the lowest crude death rate yet recorded, namely, 11.4 per 1,000.

The infant mortality rate for 1930—60 per 1,000 live births—is the lowest so far recorded. Here we note a remarkable seasonal change. Until 1900 the greatest number of deaths among infants occurred during the summer months. Since this century came in the infantile death rate has fallen in each successive quinquennium, due in large measure to the more effective control of summer diarrhoea, until now the lowest rate for infantile mortality is found in the third quarter of the year; the first quarter, here also, presents the highest death rate. A comparison of the figures for the past few years suggests that the rate of this improvement is slackening and that any further decline is likely to be at a decreasing rate. It is rather curious that amongst the causes of death in infants congenital malformations play an increasingly important rôle, the mortality rate from these conditions having risen year by year from 4.16 in 1923 to 5.27 in 1930. There are also remarkable regional variations in the deaths from one of these—spina bifida—not found in the case of other malformations, London having a considerably lower, and Wales and the north a considerably higher proportion than the average. The cause of this is not apparent.

Respiratory diseases were much less com-

mon among infants during 1930 than in 1929, a decrease of 36 per cent, owing, probably, to more favourable climatic conditions. Measles was the only cause of death to show an appreciable increase—18 per cent—and this increase was most noticeable in London and the south.

Typhoid fever is now under control, the standardized death rate being only 7 per million as compared with 371 per million fifty years ago. This is the lowest figure yet recorded.

Cancer is one of the diseases that appears to be unaffected by seasonal conditions. Whether this dread disease is actually on the increase or not is still being debated. Comparison by the Registrar-General of the three decennia, 1901-1910, 1911-1920, 1921-1930, shows that the cancer mortality has risen during the present century by 28 per cent for males, and 5 per cent for females. The crude death rate shows a much higher rate of increase, and, in his opinion, emphasizes the need for taking into account the increasing proportion of elderly persons in the general population. He thinks, too, that the rapid increase in the incidence of cancer of the lung "suggests improved means of diagnosis". On the other hand a distinct diminution is noticed in the mortality from uterine cancer between 1911-1920 and 1921-

1930. This may be due in the main to better treatment, but, it may be remarked, the mortality in this particular affection has always been considerably higher for married than for unmarried females, and the increasing numbers of non-parous women among the former class, associated with the declining birth-rate, may have something to do with the diminution.

It is worthy of note that the mortality from puerperal conditions during the period 1926-1930 is higher than that recorded in the three preceding quinquennia. This fact, however, may be misinterpreted. The risk of death is greater for primiparae than for multiparae. The increase in the proportion of first-born children that is becoming evident tends to increase the crude mortality rates for puerperal diseases, expressed as a simple ratio of births to deaths. Thus, any reduction in the mortality that has resulted from the various maternal welfare schemes now in operation is apt to be masked.

Statistics dealt with in this way are in the highest degree informative, and when more such have been collected, and become available from more countries, we may be in a fair way to solve some of the problems in relation to variations and trends in disease that so far have baffled us.

A. G. N.

THE RELATIONSHIP BETWEEN TRAUMA AND CANCER

THE relationship between injury and cancer is important, but it is still obscure. The importance is becoming more generally recognized, but the obscurity surrounding its exact significance has not been lightened to any great extent. Where before there was little hesitation in ascribing cancerous growth to given localized traumata—contusions of the breast, scarification of the tongue with a ragged clay pipe, repeated lacerations of the cervix, and irritants of all sorts—there now is a tendency to take into account other factors as well, and it is round these that the obscurity persists. The result of this dubiety is particularly evident in claims for compensation, in which cancer has seemed to follow as a direct result of injury. In 1908 a standard authority could

write: "That cancerous and sarcomatous tumours develop after an accident, close to the site of the injury and that one is the direct sequence of the other, there is not the least doubt. How the tumour comes we do not always know . . . In some cases the connection is clear enough, and the claim for compensation can be honestly maintained . . ." But in 1913 another authority, Sir John Collie, becomes far more cautious: "If asked," he says, "whether a malignant disease which has been discovered after the accident is the result of that accident, the only answer which an honest witness can give is that as science has not yet discovered the cause of cancer, he is not prepared to deny or affirm that a malignant growth may be caused by an accident . . . When it is

alleged that a malignant growth found after an accident was caused by it, one ought to qualify the admission of possible causal relationship by stating that science has not adduced conclusive evidence to support the theory that trauma is an undoubted factor in the etiology of malignant disease."

Dr. Fred. L. Hoffman* has pointed out that one of the most encouraging methods of approaching the problem is through a study of cancer occurring in relation to occupation. There are certain forms of occupational cancer which have been recognized and studied for years. The best known, perhaps, are chimney-sweeps' cancer and mule-spinners' cancer, but extensive studies are being made of the incidence of cancer in other occupations; amongst aniline and other chemical workers; those working with radioactive substances; and those exposed to weather conditions, especially sunlight, such as agricultural workers, seamen, fishermen, etc.

Apparently it is too early to draw any conclusions from these records as to the exact influence of trauma in producing cancer, although their value in suggesting safeguards for the workers is very great. An example of this latter point is to be found in the way in which cancer of the bladder amongst aniline workers was dealt with in a special report of the International Labour Office, Geneva, in February, 1921. Amongst the conclusions of this report it was stated that hygienic precautions would undoubtedly lead to the diminution and even disappearance of the disease amongst the workers, as far as their occupation could be blamed. These precautions were therefore strongly impressed upon all such factory workers exposed to the fumes of aromatic bases. But beyond setting in motion such pre-

cautionary measures there has not been much definite advance. Perhaps the best summary of the position is given in an extract quoted by Dr. Hoffman from a statistical study of occupational cancer published by the Medical Research Council in 1926:

"It must be acknowledged that though confirmatory evidence has been obtained of some views already more or less accepted as to the close association of some types of cancer with exposure to particular risks incurred in certain forms of employment, *e.g.*, chimney-sweeps' cancer and mule-spinners' cancer, evidence in support of such a connection between the nature of the employment and other forms of cancer, especially those localized internally, cannot be regarded as more than suggestive. In some occupations the excessive indulgence of habits like smoking and drinking, which the nature of the occupation permits or facilitates, appears to be the important predisposing factor, and not anything inherent in the occupation itself, while the incidence of syphilis in different occupational groups seems to have some association with that of lingual cancer. In the data examined it is not uncommon to find, however, in occupations an excessive mortality from cancer in certain sites for which no apparent explanation can be found in the industrial risks. This emphasizes the fact that occupational risk is only one of several predisposing causes of cancer which are operative in different instances or under different circumstances, and supports the view that the discovery of any one specific factor is not likely to provide a solution of the complex problem of the origin of the disease."

Dr. Hoffman has gone no further, except to indicate the best sources for studying the question, and that is no small contribution, considering the modern jungle of literature on cancer. He looks for greater care and diligence in the collection of observations in large groups of cases, over long periods of time. When the statisticians are finally presented with this material for digestion we may hope that they will provide us with a clearer understanding of a relationship which, though apparently intimate, is to be properly understood only after due appreciation of other factors.

H. E. M.

*The Occupational Incidence of Cancer; a paper contributed to the International Occupational Disease Conference, Geneva, 1931.

Editorial Comments

Dr. George Gordon Campbell

The *Journal* has to record, with great regret, the death of Dr. George Gordon Campbell on June 26, 1932. For many years he had been connected with the teaching staff of McGill University, and was in charge of pædiatrics and dermatology at the Montreal General Hospital. He only retired from his active duties in this connection about a year ago.

Doctor Campbell had a distinct literary "flair" and for some years was on the editorial Board of the old *Montreal Medical Journal*, which eventually became merged in the *Canadian Medical Association Journal*. During the latter portion of the Great War, while the editor of our *Journal*, Sir Andrew Macphail, was overseas, Doctor Campbell, together with Dr. Maude Abbott, acted in his stead. At that time grave doubts were expressed as to whether the *Journal* would be able to carry on under the adverse conditions then pertaining in the profession. Doctor Campbell and Doctor Abbott, with quiet, determined optimism carried the thing through, and we owe to them a great debt of gratitude for the part they played at that crisis in our history.

Doctor Campbell was a genial companion, possessed of a dry humour, and was, withal, a trusty friend. As a physician his judgment was sound and he was much sought after as a consultant. His loss will be greatly felt. The *Journal* desires to record its sense of its loss, and extends to the bereaved family its sincere sympathy.

A.G.N.

Dr. William Williams Keen

Dr. William W. Keen, the renowned American surgeon, passed away on June 7, 1932, at the age of ninety-five years. He had expressed the hope that he might live to reach one hundred, but it was not to be. A weak heart precluded this. His life was remarkable for its fullness and its impress upon his fellows. Even when he retired from active teaching and surgical work, twenty-five years ago, he continued to occupy a foremost position in the minds of men.

Doctor Keen was born in Philadelphia in 1837. He received his preliminary education at the Philadelphia High School and entered Brown University in 1853. He had intended to study for the ministry but gave up this idea in order to take up medicine. He had not yet completed his course when the Civil War broke out and he served as a medical man with the troops of the North, managing, however, to continue his studies. In 1862 he received the M.D.

degree from Jefferson Medical College, and returned to the army fully qualified. After the conclusion of the war Keen became associated with Weir Mitchell, and he collaborated with him and Morehouse in the publication of some interesting papers on neurological surgery, then a new subject. Thereafter he went to Europe, taking up further study in London, Paris, Vienna, and Berlin.

In 1866, on his return to Philadelphia he instituted the Philadelphia School of Anatomy, where he taught anatomy, surgical pathology, and operative surgery. He held several surgical appointments in the succeeding years, lecturing, too, on artistic anatomy, but eventually became Professor of Surgery in his own medical school, where he established a surgical clinic of the first importance and impressed himself notably as a teacher. A prolific writer on medical, social and religious topics, he made himself respected for his honesty of purpose, directness and fairness. He, further, was an early exponent and defender of practices indispensable to the welfare of the public and the medical profession—antiseptic surgery, vaccination, vivisection and medical research. He wrote a *History of Practical Anatomy*, a *History of the first Baptist Church of Philadelphia*, and a work on the *Surgical Complications of Typhoid Fever*. But, no doubt, he was best known for his great "System" of surgery, which he wrote in collaboration with Dr. William White.

It was inevitable that his great talents and achievements should mark him out for special honour. He had been President of the American Medical Association, of the College of Physicians and Surgeons of Philadelphia, of the American Surgical Association, and of the International Congress of Surgery (Paris, 1920). He was awarded the Bigelow Medal of the Boston Surgical Society; the Colver-Rosenberger Medal of Brown University; the Gold Medal of the Pennsylvania Society of New York. Honorary degrees were conferred upon him by his Alma Mater, and by Northwestern, Toronto, Edinburgh, Yale, Harvard, St. Andrews, Pennsylvania, Upsala, and Paris Universities. He received the Order of the Crown of Belgium in 1920 and the Legion of Honour in 1923. He was a Corresponding Member of the surgical societies of France, Belgium and Italy, and was an Honorary Fellow of the Royal Colleges of Surgeons of England, Edinburgh and Ireland. A veteran of the Civil War, Doctor Keen served in two other wars, the Spanish-American and the World War.

One of the giants of our profession has

passed. Among his contemporaries he was perhaps the only one who might be compared with Osler, in his range, his enthusiasms, and his power of making friends. A.G.N.

Proceedings of the University of Otago Medical School

An interesting little volume captioned as above (No. 9, 1932), has reached us from its Editor, Prof. D. W. Carmalt Jones, who is also a special correspondent of our *Journal*. The volume consists in the main of scientific articles reprinted from the *New Zealand Medical Journal*, the *British Medical Journal*, and the *Journal of Pathology and Bacteriology*, which first appeared during the years 1929 to 1932. Certain of the articles are illustrated. The topics considered are:— Hay Fever in New Zealand; Cholecystitis; Low Visceral Tone; the Use of Vitamin B in Cases of Oedema; Some Points in the Treatment of Pneumonia; An unusual Manifestation following Intrathecal Administration of Serum; Radioactivity; Complications of Pregnancy following the Radium Treatment of Menorrhagia; Generalized Osteitis Fibrosa with Parathyroid Hyperplasia; Anterior Sacral Meningocele; and Impacted Cyst in the

Third Ventricle of the Brain. Then follow four letters by Prof. Carmalt Jones which appeared at various times in the *Canadian Medical Association Journal*, dealing with New Zealand and its Medical Enactments, Medical Education in New Zealand, Public Health in New Zealand, and Medical Research in New Zealand. A number of valuable papers by members of the University staff are thus brought together in a convenient fashion for reference, as well as much information on the subject of Medicine in our sister Dominion.

Professor Jones and his school have our congratulations on the completion of a useful bit of work. A.G.N.

Erratum

We regret that an error appeared in the paper of Drs. Neil H. Blakie and J. C. Hossack, entitled "The Treatment of Migraine with Emmenin", which appeared in the July issue. On page 146, column 2, line 35, the sentence beginning "We do not know, etc., is incomplete. It should read:— "We do not know what the minimum dose may be nor what the number of such doses may be, nor at what time in the menstrual cycle such doses should be given in order to ensure freedom from attacks."

Retrospect

HUMAN TUMOURS AND THEIR INHERITANCE

BY MADGE THURLOW MACKLIN

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Cancer, using the term to include all malignant growths, claimed in 1928 one of every thirteen persons of all ages who died in Canada; it was the cause of death in one of every seven adults who died after they were 40 years old, ranking second only to diseases of the heart as a cause of death in this group. It is stated that every year sees an increase in the number of its victims, not only in Canada but throughout the world. This statement is subject to some modifications, which it would be out of place to discuss in this paper. Nor do we know what causes cancer. When we review the literature there emerge several main trends of thought as to its etiology. There are even yet those who consider it to be due to a parasite, but they are in the minority. There are those who adhere to the idea that trauma, either of a physical or chemical nature, initiates the growth. These persons, it is safe to say, are in the majority. There are, finally, those who hold that it is an expression of tissue capacity for overgrowth, and that this expression

is an inherited one, a capacity that is handed down from parent to child in the germ plasm.

There is so little proof that cancer is due to a parasite,* that we will consider the evidence only for the latter two theories, namely, that cancer is due to chronic trauma, and that it is due to heredity. We find the idea that injury is a basic factor deeply ingrained in the profession as well as in the laity. Indeed, one physician said that "chronic irritation" made a good talking point and was as valuable as anything else as the cause, since we do not know the underlying basis of cancer anyway. Now it is quite right and justifiable, as we shall see from the evidence shortly to be presented, to urge persons to avoid chronic irritation, to have their jagged teeth attended to, to have sores that will not heal looked after, to have a source of chronic irritation removed if possible. On the other hand, such an insistence upon chronic irritation as the etiological factor gives a false sense of security to those who have

*This statement, of course, refers only to those theories that cancer is dependent upon some hitherto undiscovered endocellular parasite. Loeb¹ states "Recent investigations do not support the view that micro-organisms are of any significance in the etiology of cancer." Cases of cancer of the human bladder due to Bilharzia, of cancer of the liver in cows or rabbits or rats due to infestation with some parasite, are to be regarded as coming under the theory of chronic irritation, not the parasitic theory.

not suffered from any chronic irritation. The unmarried woman will feel that she has no need to fear cancer of the cervix since the cause for this is commonly thought to be lacerations at childbirth. The non-smoker pays no attention to the sore on his lip because he never smoked. Those whose mouths have never been subjected to the rubbing of ragged teeth will think they need not fear buccal cancer. Chronic irritation may be a good talking point, if we explain its limitations; it is a dangerous one if we lay all the stress upon that to the exclusion of other factors.

CHRONIC IRRITATION AS A CAUSE OF CANCER

Let us take up in more detail the arguments that are advanced by those who believe that chronic irritation is at the basis of cancer, and test them in the light of undisputed facts. Thus, for example, the statement is made that the reason for lip cancer being more frequent among men than among women is that men smoke, and that the irritation caused by the hot pipe on the lip produces cancer. We see statements to the effect that it is the unrepaired injury received at childbirth that is responsible for cancer of the cervix. Breast cancer is attributed by some to the tight clothing bound about the breasts, or to the irritation caused by lactation.

Breast cancer.—We will take up the evidence for breast cancer first. Pack and LeFevre² analysed almost 3,000 cases of breast tumours, and from their extensive series found that breast cancer occurred relatively more frequently in unmarried women than in those who were married. The women of Japan who nurse their babies through much longer periods than do Western women, and who have far more babies to nurse, have a much lower incidence of breast cancer than do the women of England, for example. In 1906-1910, according to Hoffman,³ their death rate per 100,000 from breast cancer was only 1.8, as compared with a rate of 17.9 for the English women during the same period. Chronic irritation then is not an important factor in breast cancer.

Uterine cancer.—Pack and LeFevre state that Dr. Seelye Little found that cancer of the uterine cervix was more common among the unmarried and the sterile married women than among the married women with children, again throwing out of court the idea that it is injury received at childbirth that is the exclusive factor responsible for this type of cancer. Pack and LeFevre found that cancer of the body of the uterus was as frequent among single as among married women, and occurred at an earlier age in the former.

Skin cancer.—Paraffin workers develop cancer of the skin of the thigh from continuous soaking of their clothes with oil. It is true that the incidence of this type of cancer is higher among paraffin workers than it is among the males of the general population, thus showing some connection between the occupation and the cancer. But by no means all paraffin workers develop cancer,

less than one per cent showing it. Therefore chronic irritation cannot be the sole factor.

It has been found that by painting the skin of rabbits with tar, skin cancer can be produced. But not all rabbits so treated develop cancer. Some of them continue to be immune. Moreover, not all species of animals are susceptible to this form of irritation, some of them being practically immune to tar cancer.

Chimney sweep's cancer.—We have heard a great deal of cancer of chimney sweeps, and if we look at the death rate per 100,000 among this group at varying ages and compare it with the death rate in other industries, we find that there is some justification for the term "chimney sweep's cancer." Thus in England and Wales, for the years 1890-1892, we find that the death rate from cancer among chimney sweeps was 124.2 per 100,000 as against a general rate for all males of 36.6. These rates applied to males between 35 and 44. When the ages 55-64 were considered, we find the death rate from cancer among the chimney sweeps rising to 790.3 per 100,000, as against the general death rate for males of that age of 276.2. On the other hand, when we view it in actual figures we find that of 5,634 chimney sweeps between the ages of 35 and 44 only 7 showed cancer. In the chimney sweeps who were between 55 and 64 years of age, we find that only 17 of 2,151 died of cancer, or about three-quarters of one per cent of the group were affected. When only one-eighth of one per cent to three-fourths of one per cent of chimney sweeps are affected, we are not so sure that chimney sweeping is so productive of cancer as we have been led to believe. Thus comparing the rate of death per 100,000 for chimney sweeps with the corresponding rate for all males of the same age, we are forced to the conclusion that the occupation bears a very definite relation to the appearance of cancer, since that occupation always has a higher death rate from cancer than does any other. But on the other hand we are also forced to the conclusion that the occupation is by no means the only factor in the production of the cancer, inasmuch as less than one per cent of the chimney sweepers get it. There must be some underlying cause for cancer which is susceptible of being stimulated by the occupation of chimney sweeping, but not created by it. This is undoubtedly the *constitutional makeup* of the persons concerned. So it is with all other forms of chronic irritation and their relation to cancer. Trauma may induce a growth in a person in whom the growth would have occurred anyway. It will not induce it in a person who is not a potential cancer case.

Lip cancer.—Consider lip cancer. One physician who saw a great deal of lip cancer said that in his patients the lesion was as frequently found on the side of the mouth in which the pipe was not held, as it was on the side which received the irritation. There are hundreds of smokers who never develop lip cancer. There are hundreds who develop lip cancer who never smoked.

Warthin has presented two pedigrees of lip cancer which to my mind well illustrate the part that chronic trauma plays in the production of cancer. In both families there had been a history of lip cancer through the previous two generations. In one family there were eight brothers, the seven oldest being confirmed smokers, the youngest a non-smoker. The seven older ones did not develop lip cancer. The youngest brother died of it at 63. Irritation failed to do in seven men what was accomplished without irritation in the eighth. In the second family there were four brothers, only one of whom was a non-smoker. The three who smoked died of lip cancer between the ages of 40 and 45. The non-smoker succumbed at the age of 63. Thus in this family the persons who were subjected to the injury died of the disease at an age considerably younger than did the one who had not experienced the trauma.

Sarcoma of the testis.—A similar history is given by Champlin,⁴ only in this case it was sarcoma of testis which caused the death. The brothers in this instance were identical twins, a circumstance which holds great significance. One of them was struck on the right testis by a board, and shortly after that developed sarcoma of the testis which had been injured and died at the age of 26. The other twin had never been injured, but at the age of 31 he also developed sarcoma of the right testis. This was removed, and he was alive almost two years after the operation.

From this series of observations we might conclude with some degree of justification that trauma or chronic irritation as such does not cause cancer, inasmuch as it does not always cause cancer in those subjected to it and because not all cases of cancer are preceded by it. We might deduce, however, that trauma does play a rôle in some instances, and that its rôle appears to be the causing of cancer in a susceptible person, at an age earlier than it would have occurred without trauma. Champlin's twins are excellent examples of this. Identical twins are duplicates of the same individual. We may assume that both of them would have developed sarcoma of the right testis at about 31 years had no injury intervened. This injury hastened the appearance of the tumour by about six years. Trauma thus enters into the picture sometimes, but merely as a subsidiary agent, not as the prime factor.*

*Loeb states (*loc. cit.*), "In the production of cancer, heredity interacts, in the great majority of cases, with various stimulating factors over a wide range of combinations. At one end of the range external factors act with such intensity that alone, or almost alone, they can elicit the malignant change. At the other end, hereditary sensitization of the tissues is so intense that ordinary metabolic changes, or slightly abnormal ones such as would be innocuous in an ordinary individual, can lead to the production of cancer. Between the two extremes all sorts of combinations may be found." Thus this paper, while fully recognizing the part that external factors play, is emphasizing that hereditary sensitization which is too often neglected by the medical profession.

HEREDITY AS A CAUSATIVE AGENT

Let us now review the evidence presented for and against the idea that heredity is at the basis of the appearance of cancer. A great deal of experimental work has been done with cancer in animals, chief among the experimental animals being mice. It matters little whether one agrees with the explanations put forth by the various workers as to *how* cancer is inherited in mice; only those who persist in refusing to believe the evidence which is irrefutable can close their eyes and minds to the fact that in mice at least tumours of all varieties are definitely inherited. This fact has led many workers to believe that cancer in man probably follows the same rule; that it too is based upon an inherited factor.

There is by no means unanimity of opinion as to the heredity of cancer. One argument which is brought forward is that if heredity is at the basis of cancer, it is not cancer itself which is inherited but only the predisposition to it, since cancer as such is not present at the time of birth. Since birth is but one step in the unfolding or growth of the individual, we might push the argument still further, and say that nothing is inherited unless it be in the germ cell as such. Now nothing that we possess is present at the moment of conception when the germ cells fuse. The fertilized ovum is but a bundle of potentialities or predispositions which will unfold at later dates. Our definitive eye colour, our definitive hair colour, our ability to walk upright, which we certainly inherit because we are human, are none of them present at conception or at birth. They develop later on. We do not inherit the ability to talk, only the predisposition to talk, and this becomes apparent later in our life. From the practical standpoint it matters not a whit whether it is cancer, or the ability to develop cancer which we inherit. If we live long enough, and have not had the organ removed which is to be the site of the cancer, we will show it whether it was cancer or merely its predisposition which we inherited. The important thing is that we inherit some factor, call it a predisposition, a potentiality, or just "cancer". In our constitutional makeup there is something which differentiates us from the person who cannot develop cancer, and that factor is bound up in what we receive from our parents and in what we are capable of passing on to our offspring.

A second argument against the idea that cancer is inherited is as follows. One of every ten persons who live to be 40 or over dies of cancer. This number varies somewhat according to the country whose statistics are being used as a basis of discussion. Since such a high percentage as that are affected, it is inevitable that occasionally more than one member of a family should succumb to cancer. Chance alone would see to it that a family would occasionally have two or more with cancer, if 10 per cent of the adults past 40 in the population at large have it. This argument has seemed to those presenting it so conclusive that they have not troubled to investi-

gate the matter further. Even statisticians, such as Hoffmann of the Prudential Life Insurance Company, offer the above argument against the idea that cancer is inherited.

Let us examine the data a little more in detail, and we will see that the arguments against heredity are not so weighty as they were thought to be. Take for example the case of the twins with sarcoma of the testis. If we look up the frequency of this condition in Canada for 1928, (assuming that the population in all of Canada is fairly representative of that found in civilized countries, we see that there were only 9 males under 30 who had cancer of the genito-urinary tract. Now there were about 2,850,000 males under 30 in Canada. Of the 9 who had tumours of the entire genito-urinary tract, including all types of tumour of kidney, ureter, bladder, prostate, seminal vesicles, penis, and testis, there were certainly not more than 3 who had sarcoma of the testis. We might even question whether there was one. If we allow that there were 3 who had sarcoma of the testis, that means that the chances were only 1 in 950,000 of a male under 30 having that condition. Yet here were two brothers with the same type of tumour, in the same organ, on the same side, at approximately the same age. The chances are extremely remote that this was mere chance. They are so remote that we only consider that some condition which was very definitely correlated with the fact that they were brothers was at the basis of the condition being present in both.

Take another example. Power⁵ reported a family in which a father and two of his three sons died of breast cancer. The fourth son had sarcoma of the throat. Thus in a population of four males 75 per cent died of breast cancer under the age of 46. In the population of Canada there were only 2 males among a population of 3,858,000 males under the age of 46 who had breast cancer. Thus this family of men showed a prevalence of breast cancer which was 1,500,000 times as great as that exhibited by the general population of men under 46. Certainly here there can be no talk of such a high incidence of cancer that one is bound to find families with more than one affected.

Even if we take so common a type of tumour as cancer of the breast in women we find that the chances are by no means that one in every ten women will die of that disease as the opponents of the heredity theory would have us believe. For example, take the case reported by Leschotziner⁶ of the mother and her three daughters who had their breasts removed for breast cancer before they were 21. Now there were in Canada in 1928, about 2,180,000 females under the age of 21. Only 2 of these had died of breast cancer, or 1 in every 1,090,000. A percentage of 100 in this population of four women was what we found dying of breast cancer. It does not require much imagination to make one's choice as to whether one would rather belong to the general

population or to that family, if chances of dying of breast cancer were considered.

But there may still be some who feel that the examples I have chosen are not representative of the cancer population. Take, then, for instance, the family reported by Smith⁷ of a mother and her two daughters who died of breast cancer at the ages of 70, 74 and 76. Again looking at the statistics, we find that in Canada in 1928 there were about 77,160 females between the ages of 70 and 76. We also find that of this group, only 82 died of breast cancer. Thus the chances for a woman from the general population to die of cancer of the breast between the ages of 70 and 76 are about 1 in 940. Yet in this family three women out of five died of breast cancer. The fourth woman, also a daughter, died at 74 of gastric cancer; the fifth was so far normal. A son of the first mentioned woman, and brother to the three sisters with cancer, died of cancer of the liver at 62.

What is the reason then that this fact has not been generally grasped? Why is it that with such a high mortality from cancer, the chances seem to be relatively few that a given person will die of cancer of a given organ at a given age? The opponents of the theory that cancer is inherited, have overlooked the following significant facts. There are different types of tumour, among them being—sarcoma, fibroma, myoma, osteoma, chondroma, and various types of carcinoma; and there are numerous organs many of them capable of exhibiting a variety of tumours. If cancer were scattered equally throughout the population and not inherited, then when chance did bring two members of a family into the cancer list the chances would be very remote that they would have the same type of tumour in the same organ, and appearing at approximately the same age. When those three factors are taken into consideration, then the presence of cancer in more than one member of the family becomes highly significant.

(1) *Evidence from pedigrees that tumours are inherited.*—We have dealt with the statistical considerations which lead us to conclude that cancer is inherited. Are there any other facts which support this conclusion? It will be impossible to present the evidence in detail in this paper in support of the statements which will have to be made more or less arbitrarily. The evidence has been collected and will be published in a paper on this subject in a future number of the *Quarterly Review of Biology*. The other facts which strengthen the belief that cancer is inherited are as follows.

(2) *The frequent high incidence of cancer.*—There are numerous families in which the incidence of cancer is so high that it precludes any explanation that it is by chance alone that these persons were affected. Warthin's family S is an excellent illustration. Here there were 38 members dying of cancer through four generations. Gardner and Frazer reported a family

with neurofibroma of the acoustic nerve in which there were 38 affected through five generations.

(3) *Similarity in the site of the tumour.*—Although there are, of course, many instances in which the members of the family who are affected have cancer of different organs, these do not appear so frequently in the literature as do the families in which the same organ is more or less found to be affected in all the members, or in which the cancer is limited to two different systems. Thus the occurrence of the tumour in the same organ in the different members of a family is in favour of its being inherited.

(4) *Similarity in the type of tumour.*—The tumour tends to be of the same variety in different members of the family. Thus, if sarcoma of the choroidal coat of the eye had affected one member, the other members of the family are more apt to be affected by sarcoma of the choroidal coat than they are by glioma of the retina. If fibroma of the uterus affects one sister, the other sisters are more apt to show fibroma than they are carcinoma.

(5) *Similarity in the age at onset.*—Tumours tend to occur at the same age in different members of the family. Thus, although the average age of death from cancer lies somewhere between 55 and 63, 62 being the average for Canada in 1928, there are families who die of cancer at ages very much younger than that. The females in Warthin's S family died of uterine cancer at the average age of 40, and the male members succumbed to stomach or duodenal cancer at about an average age of 35. Death from breast cancer occurs at the average of about 55 years, but Leschoziner's family died of it at 14, 19, 21 and 22.

(6) *The similarity of tumours in identical twins.*—Finally, tumours in identical twins, whose inheritance we know to be identical, are of the same type, occur in the same organ and at approximately the same age. Thus ovarian cyst, cerebellar glioma, intracanalicular adenofibroma of the breast, sarcoma of the testis, sarcoma of the choroidal coat of the eye, etc., have been reported in identical twins.

Sporadic cases of cancer.—It is true that cancer appears in a member of a family when there is no family history of the condition. It is true that cancer of one type and in one organ may affect one member, while another type of tumour in another organ may affect a second member. Thus, one brother may have carcinoma of the stomach, his brother have sarcoma of the throat, while a sister has myoma of the uterus. Or the same type may affect different members in different organs. Thus one may have carcinoma of the stomach, while another has carcinoma of the rectum. That does not in the least exclude any of these cases from being in the category of inherited cancer. We may have an individual who develops tuberculosis and we may be unable to determine just how it was transmitted, but that does not preclude its being an infectious disease. We may have one brother with chronic pulmonary tuberculosis, while another has tuber-

culous meningitis. Or we may have an individual with tuberculous lymph-nodes in the neck, while another member of the family has tuberculous nodes in the groin. Yet all cases are tuberculosis, and all cases are infectious in origin.

It is not intended to discuss the numerous theories here as to the actual method of inheritance in cancer. After all, they have in most instances only a theoretical value. Because cancer appears on the whole at so late a time in life, after the person has his family raised, perhaps after all the grandchildren which he will ever have have been born, it is of no significance for us to know that cancer is inherited as a dominant, or as a recessive, or that it is due to multiple factors.* The fact of prime importance is that *cancer is dependent upon heredity*, and that the appearance of cancer, whether in the parents or in brothers and sisters, should put the remaining members of the family upon their guard.

This viewpoint, far from being discouraging and causing alarm, should give us the best weapon we have for detecting cancer in its early stages. Even if cancer were not inherited, the chances of our dying of some type of cancer of some organ or other is one in seven if we are 40 or over. That in itself is sufficient cause for disquietude. The added statement that it is hereditary cannot alarm us much more. Suppose, however, that we know that a mother or an older sister of our patient has had breast cancer, then we should educate our patient to come for periodic examination for the earliest signs of cancer, particularly of the breast, although other organs must by no means be glossed over in the examination. We must educate our patients to come early, and if that is to be of use, we must educate our physicians to detect the early signs. Hence the necessity of cancer centres, where a group of men do nothing else than diagnose and treat cancer; where patients can rely upon getting the best of diagnosis and the best in treatment. In these cancer centres,† research can be carried on into the preliminary changes, if any, which may be detected in this population which is more susceptible to cancer than is the general population. When we get our cases late, when many physicians cannot even diagnose cancer until the patient

*This statement may be open to criticism by those who believe that such knowledge would assist in breeding out cancer. In 50 per cent of the cancer cases, the disease is not manifest until the patient is past 60, probably a parent and a grandparent by that time. The impossibility of predicting who will be a cancer case in the majority of instances, and the fact that the individual may live a long life of usefulness and perchance die of some disease other than cancer, leads me to conclude that at present, the knowledge of the mode of its inheritance holds little significance.

† Since this paper was accepted for publication, the Report of the Ontario Royal Commission for the use of radium and x-rays in the treatment of the sick has appeared. This Commission recommends the establishment of three such cancer centres in Ontario, to be located in London, Kingston and Toronto, in connection with the three medical teaching centres of the province.

is on his death bed, then we will make no progress in the conquest of the disease, either in therapy or diagnosis.

Two case histories may be cited here which have come under the observation of the writer as illustrative of the attitude of some of the profession, a small minority, let us hope.

A woman of 64 went to a physician, stating that she had a lump in her side. A physical examination was never made and she went along for two years, during which time she complained of increasing breathlessness and was treated for "heart trouble". In the middle of March the dyspnoea became so intense that she could no longer move about. Upon the advice of a friend, she was x-rayed. The heart was seen to be normal, which was confirmed upon further examination; and there was a great mass of cancerous glands in the mediastinum pressing upon the trachea. She died from her breast cancer six weeks after the correct diagnosis had been made.

The second case was that of a man of 74. For several years he had been suffering from constipation. He went to his physician at intervals for this, but was never examined. After about two years, he had an attack of obstruction of the bowels for which he applied for relief. He said, "I think I have cancer of the rectum. My father died of it and my mother's sister died of cancer of the duodenum." The physician scoffed at the idea, gave him a purgative, and dismissed him. Three months later he died following an operation for complete obstruction in the sigmoid flexure.

Such cases illustrate the need for better training of our students in the recognition of cancer, and the need for the creation of centres where patients may go to those who are experts in that field. The latter case also illustrates the necessity for training first of all our profession, and, secondly, the laity, concerning the inheritance of cancer. Such information need not be lacking in therapeutic value. One need only consult the articles by Dukes⁸ in which he has shown that in rectal

cancer, one of the commonest types of cancer encountered, the condition is frequently preceded by polyps which can be seen with the sigmoidoscope and which can be removed, so that the site at which cancer will develop is resected before the malignant change sets in. Dukes reports a patient whose brothers and sisters had died of rectal cancer, in whom he removed the polypoid section of the rectum before it turned to cancer.

Whether the knowledge that cancer is inherited will prove more discouraging than beneficial at first is hard to say, but refusal on the part of the profession to recognize the fact that it is inherited will neither alter the fact of its inheritance nor lead us into ways by which we may combat it. Recognition on the inheritance of cancer may afford us opportunities for early diagnosis in a family in which one member has been known to be affected. Periodic examination of this susceptible population will inevitably lead us to an earlier diagnosis and with it a greater opportunity for cure. It may actually lead us ultimately to a means of prevention.

It is with pleasure that I acknowledge my debt to my husband, Prof. Charles C. Macklin, who has given me so much help in the way of suggestions and advice for this and others of my papers on Human Inheritance, as well as much of his time in the editorial revision of my manuscripts.

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Men and Books

THE MEDICAL HISTORY OF BRITISH COLUMBIA*

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Vancouver

NANAIMO

Nanaimo ranks with Victoria as one of the oldest settlements in British Columbia. For that reason its history, extending over a period of over eighty years, is of more than passing interest. It was in 1849 that the barque *Harpooner* dropped anchor in Nanaimo harbour, bringing some twenty-one settlers to the new colony of Vancouver Island. Among these were eight coal miners destined for Fort Rupert on the north eastern end of the island, to open up the coal measures there, while the rest made their way south and settled at Sooke, near Victoria.

* Previous instalments of this article can be found in the *Journal*, 1931, 25: 336 and 470; 1932, 26: 88, 225, 345, 601 and 725.

It is interesting to note that in the colonization projects of the Hudson's Bay Company on the Pacific Coast medical men played a prominent part. So we find, as one of the passengers on the *Harpooner*, Dr. Alfred Robson Benson, listed on the ship's register as surgeon and clerk. As no white settlers were established at Nanaimo at that time, Dr. Benson joined the group in the southern part of the island, and in 1850 we note he attended Governor Blanshard at Victoria.

With the discovery of coal on the beach at Nanaimo, in 1851, by an Indian, who received on that account the name of "Coal Tyhee," the Company decided to concentrate its mining activities on this more convenient and accessible area. On June 1, 1854, the ship *Princess Royal* left England on its long trip around the Horn, with a number of settlers for Esquimalt. Among these was a small group of coal miners, accompanied by their families, destined for Nanaimo where they arrived November 27, 1854. With the development of the coal industry, Nanaimo early in the history of the colony became an

important trade centre, and we find the name of Dr. Benson associated with it as pioneer physician in those early days, first in the Hudson's Bay service, 1857-1862, and later as colliery surgeon to the Vancouver Coal Company, 1862-1864. Dr. Benson was returning officer in the celebrated Nanaimo election for the Provincial Legislature, June 23, 1859, the candidate being Capt. John Swanson, of the Hudson's Bay Company steamer *Labouchere* and Capt. Charles E. Stuart was the only qualified voter. The return mentions that Capt. John Swanson was duly elected by a majority of one. In recording the election and the incidents in connection with it, the local paper comments:—"This caps the climax of all elections that were ever heard of where Anglo-Saxon language is spoken." In the *Colonist* (Victoria, B.C.), July 1 and 6, 1859, we find mention of an election that had taken place there a short time before when John George Barnston, of Victoria, had been elected by Stuart, but for some reason not stated, Barnston did not take the seat. A story is related of Dr. Benson that a man who had aroused the ire of the Doctor by unmercifully kicking his dog came to him one day to have an aching tooth pulled. With the tooth firmly in the grip of the forceps, the Doctor said "So you are the man who kicked my dog!" -- this followed by a pull, the same remark again and another yank, and so on a number of times until no doubt the man heartily wished he had never seen the dog.

Local chroniclers connect Dr. Benson with the late Archbishop of Canterbury. Certainly the name was the same, but whether he was a brother or not could not be verified. When Dr. Benson's wife died in Nanaimo he installed in her memory three windows in the original St. Paul's Church. These windows seem to have disappeared, and it is reported that they are at present located in some District Anglican Church. Mount Benson, named after him in 1859, by his friend Captain Richards of H.M. survey ship, *Plumper*, is a beautiful elevation, 3,366 feet in height, about two miles west of Nanaimo, from the summit of which an unequalled view of the Gulf of Georgia is had, from Jervis Inlet to Mount Baker, and on a clear night one may see the twinkling lights on the streets of Vancouver, some forty miles distant. Previously this mountain had been called by the Indians and officers of the Hudson's Bay Company, "Wake-siah", a Chinook word meaning literally "not far." Doctor Benson spent his remaining years in Whitby, Yorkshire, the place of his nativity, where he died about 1905.

In the little cemetery at Nanaimo one may see the grave of Dr. Klyn Grant, about whom local tradition has woven an interesting story. It is said that he was a man of note in London and an editor of *The Lancet*. For reasons that

made it desirable for him to leave England he found his way to this little known outpost of empire and remained there until his death some sixty years ago. He lived alone in a small cabin, cooking his own meals, and generally isolated himself from his neighbours. A story of him is related by Mr. David Stevenson, a pioneer of Nanaimo. Dr. Grant announced one day that he had discovered the quickest way to boil water. Upon being asked what his method was he said,—"Boil it in a frying pan." Another story told by Mr. S. relates to a deer-hunting expedition, when he had as a companion a young doctor recently arrived in the district. After bringing down their deer, the doctor was asked to eviscerate it and make it ready for packing. As liver and bacon were to be on the breakfast menu, the doctor was requested to segregate the liver for the morning meal and this was accordingly done. He was next reminded that the gall should be removed and the doctor, after a diligent search, confessed to defeat as he could not find it. Mr. Stevenson then sprang his little joke when he said, "Don't you know, doctor, that a deer hasn't a gall?"

In the seventies we find Dr. Loftus McInnes in the position of colliery surgeon. Later he removed to New Westminster, where he passed away a decade or so later. Dr. Phillips, Dr. Gamble and Dr. Robert W. W. Carrall, the latter mentioned in a previous chapter, all practised for a time in Nanaimo about this period. In the "eighties," in addition to the foregoing, the names of Dr. Cluness, a member of the first Medical Council, who died in 1886, Dr. S. B. O'Brien, Dr. W. W. Walkem, Dr. P. J. Rice, Dr. Praeger and Dr. W. Bell Campbell, all of whom have passed away, are still remembered by the older citizens of Nanaimo. Dr. Michael Callanan, L.R.C.S. & P., Ireland, 1874, practised in Nanaimo in the late "eighties." He removed to the Cariboo in the "nineties" and for a time represented that constituency in the local legislature. His last years were passed in New Westminster, where he died some years ago.*

Dr. L. T. Davis, whose death occurred recently, practised for over forty years at Nanaimo and district. He was a man of genial disposition and well liked by a large circle of his fellow citizens. The writer met him on numerous occasions and entertained a high regard for him. From his widow we obtained the following brief biography.

"Lewis Thomas Davis, born in Portland, Maine, July 4, 1862. He went to Canada at a very early age with his parents. He first went

* The writer wishes to express his grateful thanks to Mr. William Lewis, Mr. David Stevenson, well known pioneers of Nanaimo, and to Mr. William Mitchell, President of the Board of Trade, for their assistance and cordial cooperation in gathering the foregoing data.

to school in Port Hope and then to Queen's University, from which he graduated (M.D., C.M., 1881). He first practised in Redwood City, California, coming to Nanaimo as assistant to Dr. Cluness in 1884. For many years he held the post of medical officer to the Indian and Marine Departments. He was also physician to the Nanaimo Gaol, and was medical officer to the Nanaimo Hospital until 1911, when he removed to Victoria to accept a position as health officer. He finally settled in Parksville, V.I., in 1918 where he continued to practise until his death, September 23, 1929. He married August, 1887, Eve M. Reynard, daughter of the late Rev. J. Reynard, pioneer minister of the Cariboo and Mrs. Reynard."

KAMLOOPS

Kamloops, on account of its situation at the junction of the North and South Thompson Rivers, has since the days of the fur traders been an important point on the line of travel between the coast and the interior. In 1882 the Royal Inland Hospital was built, and from a small beginning it has developed into one of the leading hospitals of the province. Old timers in Kamloops will remember Dr. Sibree Clark, one of the first physicians to practice in that city, and his name appears in the first medical register of the province (1886). Like many of the older school (he graduated in 1877) Dr. Clark combined a drug-store business with his practice. He was also coroner for a number of years. He took a great interest in Masonic affairs and was generally held in high esteem by his fellow citizens. He passed away many years ago.

Dr. Edward Furrer (Trinity Medical School, Toronto, 1884, M.R.C.S. Eng.—registered B.C., 1887) commenced practice in Kamloops the same year and was Canadian Pacific Railway surgeon at that point for many years. Dr. Furrer was a native of Switzerland and at one time was a master of Upper Canada College. He was a man of liberal education, pleasing personality, and of a genial disposition. His passing in the early years of this century was much regretted by all who knew him.

Thomas Wilson Lambert, M.B., B.C., Cambridge, England, 1889, (registered in 1892). He was a native of England, his family residing at Hull. He was related to the Wilsons of Tranby Croft, a place that achieved some prominence in the early "nineties" of the last century. Dr. Lambert was for a short period before removing to Kamloops stationed at Lytton in charge of a small Anglican Hospital for the care of Indians. He was associated in practice with Dr. Furrer, of Kamloops, for several years when he achieved a reputation as a capable and dependable surgeon. During this period he was also a member of the British Columbia Medical

Council. Following his return from a visit to England in 1897, he accompanied Capt. John Irving, of Victoria, 1898, on a trip to Dawson, going by way of Nome and the Yukon River. Being possessed of private means the lure of practice did not greatly appeal to him, and soon after his return from the northern gold fields, he went back to England to reside. He died in London, England, on April 10, 1920. Dr. Lambert was well known to the writer, who acted as his *locum tenens* for some months (1896-7). He was a man of fine appearance, tall, straight, of athletic build, and very fond of sport, particularly fishing, at which he was an expert. He and a companion made a record haul in 1897, when they caught in four or five days with the fly some seventeen hundred trout. The fish were strung on a line and a photograph taken of them, so that all and sundry might see and believe.

VANCOUVER

Although Vancouver can trace its origin to the early "seventies," when the Hastings saw-mill was built on the shores of Burrard Inlet and the little hamlet was known as Granville, yet it was not until 1886, having discarded its former appellation and adopted its present name, that it became known to the world as the Pacific terminus of Canada's transcontinental railway. During this period, when its population was small, practically consisting only of loggers and mill employes, medical service was supplied from New Westminster, a dozen miles away. Dr. W. W. Walkem, in the mid-"seventies," made Burrard Inlet his headquarters for a few years. In addition to providing a medical service to the local population he was Justice of the Peace and Coroner. In the early "eighties" he removed to Nanaimo, when, after twenty years or more of practice, he finally settled down in Vancouver, where he remained until his death about the close of the Great War.

Dr. Duncan Bell-Irving, a graduate of one of the London schools, 1883, came to Burrard Inlet in 1884 as medical officer to the mill industries and after a short period he left the country and did not return again until about 1888, when he made Vancouver his permanent home. While Dr. Bell-Irving was well known to Vancouverites for four decades, yet it was only during the first years after coming to Vancouver that he actively practised his profession. He early associated himself with his brother, the late Henry Bell-Irving in the salmon-canning industry and other commercial activities which he continued until the time of his death a few years ago.

The medical population of Vancouver in 1886, the year of its birth, consisted of less than half a dozen practitioners. Two of these, Dr. H. E.

Langis and Dr. W. J. McGuigan, had been engaged on Canadian Pacific Railway construction and with the completion of the railway in 1885, had established themselves in the new Pacific port. Dr. J. M. Lefevre, formerly of Brockville, Ont., had, in 1885, been appointed Canadian Pacific Railway surgeon at Vancouver, and as the construction of the Port Moody-Vancouver branch was still in progress he established a small hospital at Powell Street.

As the medical history of Vancouver is contemporaneous with its hospital development, a brief sketch of the latter will suffice to give us a picture of the former. We are indebted to Dr. A. M. Robertson (McGill, 1885; registered B.C. 1887), for the following interesting account of those early days in Vancouver's history. "On my arrival in Vancouver, six months after the great fire in 1886, to be exact, on the last day of January, 1887, I found that the only hospital accommodation was a small shack at the east end of Powell Street, near where the sugar refinery now stands. There were only five or six beds under the care of a man and his wife and it served for the reception of Canadian Pacific Railway surgical and medical cases. It had been in operation for a few months on my arrival and Dr. J. M. Lefevre, then Canadian Pacific Railway surgeon, was in charge. As his partner it soon became part of my daily routine to plough my way through the mud out to this so-called hospital, as the Canadian Pacific Railway was still under construction between Port Moody and Vancouver, to say nothing of the work on the main line from North Bend westward as well as that of Vancouver itself. It is needless to say that this first hospital in Vancouver was kept pretty busy, and, if I may say so, a lot of good work was done, in spite of an almost total absence of nursing, trained nurses being conspicuous by their absence.

"At the time of the incorporation of Vancouver, April, 1886, there were in practice, Drs. D. L. Beckingsale, H. E. Langis, J. M. Lefevre, and W. J. McGuigan. Lefevre had come with Mr. H. Abbott and other Canadian Pacific Railway officials, as in the fall of 1885 the last spike had been driven at Revelstoke by Lord Strathcona, and in the winter 1885-86 the Dominion Government that had built this western part of the road had turned it over to the Canadian Pacific Railway Company, and Dr. Lefevre was going to be the Canadian Pacific Railway surgeon. With a rapidly growing city like Vancouver, however, this state of affairs could not last long; so late in 1887, or early in 1888, I think, the real foundation of the Vancouver General Hospital was laid when the City Council opened its first General Hospital, a small two-storey wooden building on Beatty Street, the first unit of buildings that afterwards extended to Cambie Street. It was called the 'City Hospital,' and as City Health Officer, it

came under my care for some years, until the first medical staff was appointed by the Council.

"The first matron was Miss Crickmay, with a small staff of two or three nurses. She was followed by Miss McPhee, Miss Clendenning, Miss Turner and Miss MacFarlane. The first resident Superintendent was Dr. McEwen, followed by others. These men had no sinecure, being responsible not only for patients in charge but also for moneys received and paid out, had to be anæsthetist, pharmacist, as well as book-keeper, buyer, and checker of stores such as cordwood, coal, etc., a one-man job without assistance for many years. The matrons and nurses, too, labouring under many and varied disadvantages, unheard of to-day, deserved the greatest credit and well earned it, doing noble work. As time passed different units were added, such as the central administration building, private wards, and operating rooms, as well as the large general wards—an addition still standing on Cambie Street. It was here in these old buildings that a most important event occurred in the history of hospitalization in Vancouver, namely the founding of the training school for nurses."

An important factor in the hospital service of this early period was St. Luke's Home, situated on what was then called Oppenheimer Street, now Cordova, a block east of the present police station. Its founder was Sister Frances (Mrs. Dr. Wm. Redmond) and from the time of its opening in 1887 and for a quarter of a century afterwards, it did valuable pioneer work in those days when hospital accommodation was limited. In addition to handling general medical, surgical, and obstetrical work, it also carried on a small training school for nurses.

The esteem in which Sister Frances was held by the citizens of Vancouver was indicated in 1929 when she was made the recipient of the coveted "Good Citizenship" medal awarded annually by the "Native Sons of British Columbia," in appreciation of her high qualities of citizenship and unselfish service rendered to the community. At her passing in April, 1932, the local press acclaimed her as the "Florence Nightingale" of Vancouver.

During the first five years after the incorporation of the city, in addition to the names already mentioned, the medical population had been added to by the arrival of Dr. D. L. McAlpine and Dr. E. Stevenson who came in 1886, Dr. Duncan Bell-Irving, Dr. G. D. Johnston, Dr. John T. Carrall, and Dr. G. F. Bodington, who arrived in 1888; then, Dr. D. H. Wilson and Dr. W. D. Brydone-Jack, in 1889, Dr. John A. Mills in 1890 and Dr. Wilson Herald in 1891. A number of these men, in addition to establishing for themselves a fine professional reputation, were active in the public and business life of the city. Dr. Lefevre was a member of the first City Council

of Vancouver. His name will always be associated with the British Columbia Telephone Company, of which he was one of the founders and for years a prominent director. Dr. McGuigan served as an alderman, a school trustee, and finally as mayor of the city in 1904. His name appears as one of the incorporators of the Vancouver General Hospital, 1902, and he was a member of its first Board of Directors. He was also a member of the staff of that institution. Dr. D. H. Wilson, before coming to the Coast, had been a member of the Manitoba Legislature and a member of the Cabinet in the Norquay Government. When the Vancouver Medical Association was founded in 1898 he became its first president. Dr. D. L. McAlpine (Toronto University, 1863) was a familiar figure on the streets of Vancouver up to the closing years of the last century. Drs. John A. L. McAlpine and T. K. McAlpine, now practising in Vancouver, are sons of this pioneer. Dr. E. Stevenson died a good many years ago, leaving in his will a very considerable bequest to be used for Vancouver charities. Dr. Bodington (M.R.C.S. England, 1849) also F.R.C.S. England) settled in New Westminster a few years after coming to the province and was for a time before his death Superintendent of the Provincial Mental Hospital.

D. L. Beckingsale, M.D., C.M. (Univ. Edinburgh, 1872) was probably the first medical man to hold the appointment of port doctor at Vancouver. In the fire of 1886, when the city was consumed, he suffered the loss of all his personal effects and medical equipment, but in spite of this his faith in Vancouver was undiminished and he continued to practise in the city for a number of years before removing to the Okanagan on account of health reasons. From thence he went to California, and later we find him in San Francisco where he was during the earthquake of 1906. In 1912 he returned to England, re-established himself in practice in Wales and continued during the period of the war. Several years ago he returned to Vancouver on a visit and spent some time with friends here. He passed away in 1929 at the advanced age of 82 years. Of the aforementioned there are still with us Dr. Langis and Dr. A. M. Robertson, both of whom have long since retired from active practice; also Dr. W. D. Brydone-Jack, the doyen of the Vancouver profession, is still in active practice and, in spite of his three-score years and ten, shows no abatement in mental and physical vigour.

In the early "nineties" we note the arrival of Dr. S. J. Tunstall, who came from Kamloops, and Dr. F. X. McPhillips, who, since his arrival in 1893, has been closely identified with St. Paul's Hospital since it was opened in 1894. Dr. Lachlan N. MacKechnie (M.B.

Toronto, 1892) came to the province the same year, and after a short period of practice in Victoria removed to Vancouver and was for many years one of its best known physicians. He passed away in 1926. Dr. Alfred Poole arrived in Vancouver, 1893, and practised for sixteen or seventeen years. He was an active member of the staff of the Vancouver General Hospital and past-president of the Vancouver Medical Association. Of a quiet, almost shy, disposition, he was well liked and respected by his colleagues, and his passing about 1912 was regretted by a host of friends.

Dr. Octavius Weld, for many years one of Vancouver's outstanding medical men, settled there in 1895. Early associated with Dr. Lefevre as medical officers to the Canadian Pacific Railway Company, he soon became well known and established a reputation that placed him in the front ranks of the profession in Vancouver. For many years and up to the time of his death in 1922, he was a member of the staff of the Vancouver General Hospital. He was also a past-president of the Vancouver Medical Association and at the time of his passing, a decade ago, the Vancouver profession lost one of its most valuable members. Dr. Beecher Weld of Toronto is a son. Many of the older members of the profession in Vancouver will recall Dr. I. M. McLean who was medical officer of health in the late "nineties"; also Dr. Ivan Senkler who practised in Vancouver for several years about the same period. Dr. D. McLeod, who arrived in the province in 1891 and practised at Nanaimo for a number of years, went to the Klondike, and on his return settled in Vancouver where he continued in active work for a number of years before his death. Among other names that one may recall is that of Dr. A. E. Bolton, medical missionary to the Indians at Port Simpson, 1890-1902. Giving up this work he removed to Vancouver and engaged in practice for nearly ten years before he passed away. Dr. George W. Boggs came to the province about 1891 and practised in New Westminster for a number of years. He finally made his home in Vancouver where he was well known to the men of a generation ago. Dr. Robert Lawrence came to the province in 1893. He was a graduate of Victoria, 1871 and after several years in practice on Vancouver Island, finally settled in Vancouver in the early part of the present century, and continued more or less in active work up to the time of his death.

For the first fifteen years of its existence the Vancouver City Hospital, as it was called, was operated as a Department of the City—practically all the medical men who so wished were members of its staff—and it was not until the Klondike rush occurred, in 1897-1898, with its resultant effect in increasing the population of

the city that the need of larger and better hospital accommodation became urgent. The medical men of the day led the agitation for reorganization and finally, in 1902, the Act incorporating the Vancouver General Hospital was passed by the Provincial Legislature. We find among the fifteen incorporators the names of Drs. S. J. Tunstall, John T. Carrall and Wm. J. McGuigan. The first staff after incorporation was made up as follows.

CONSULTING STAFF

John T. Carrall, M.D. J. M. Lefevre, M.D.
W. J. McGuigan, M.D. D. H. Wilson, M.D.

MEDICAL STAFF

R. C. Boyle, M.D.	W. D. Brydone-Jack, M.D.
E. Newton Drier, M.D.	G. D. Johnson, M.D.
H. E. Langis, M.D.	J. A. Mills, M.D.
A. S. Monro, M.D.	R. E. McKechnie, M.D.
J. M. Pearson, M.D.	A. Poole, M.D.
S. J. Tunstall, M.D.	O. Weld, M.D.

OPHTHALMOLOGISTS, OTOLOGISTS AND
LARYNGOLOGISTS

G. D. Johnson, M.D. I. Glen Campbell, M.D.

It is noteworthy that there was no division of the medical staff into medical and surgical at this time. This did not take place until 1906, when the hospital moved into its new quarters in Fairview. It is interesting to note that in the year 1905, which was the last year in the old Cambie Street buildings, that the number of patients treated was 828, the cost per diem \$1.52 and the hospital days were 20,777. The report of the training school shows that the graduates for that year numbered ten, the largest class in the history of the hospital. Indicative of the growth of Vancouver we find that in 1920, fifteen years later, the number of patients admitted was 13,714, the cost per diem \$3.12 and the hospital days were 330,490, an increase during that period, of admissions and days-treatment of 1600 per cent.

While there had been an attempt in the early years of the city to form a Medical Society, with more or less success, the present Vancouver Medical Association dates its beginning to 1898, with Dr. D. H. Wilson as its first President. Five of the original members are still with us—Drs. W. D. Brydone-Jack, F. X. McPhillips, F. T. Underhill, J. M. Pearson, and A. S. Monro.

The year 1906 witnessed the incorporation of the Vancouver Medical Association Library. Great credit is due to the work of the Committee, composed of Drs. J. M. Pearson, F. X. McPhillips and Stephen, who were entrusted with the organization of this very important department of the Association's activities.

Public health service in Vancouver up to 1904 had been carried on by part time medical officers. In that year, Dr. F. T. Underhill, D.P.H., was appointed full time medical health officer for the City of Vancouver. Vancouver was one of the first cities in Canada to have a

full time, qualified, medical officer of health, and the present high standard of public health organization in Vancouver, is a monument to the quarter of a century of service that Dr. Underhill gave to the city.

In 1904 occurred an event of major importance, at least to Vancouver in those days of its youth—the meeting of the Canadian Medical Association, the first occasion when it was held in the province. Dr. Simon J. Tunstall was President and Dr. W. D. Brydone-Jack was general secretary. Mr., now Sir A. W. Mayo Robson, gave the Address on Surgery. His subject was "Surgery of the pancreas," at that time a comparatively new field. Mr. Robson was asked to see a patient who had undergone a few months previously the operation of cholecystotomy on account of a persistent jaundice. The jaundice had subsided but the fistula remained. Mr. Robson very kindly consented to do an exploratory laparotomy and found a carcinoma in the head of the pancreas. To overcome the disagreeable consequences of a permanent external fistula, he made an anastomosis with a small Murphy button between the gall bladder and the transverse colon. The operation achieved the result intended and the fistula closed, the patient enjoyed comparative comfort for several months before the disease finally carried him off. The operating room was small, and outside of the necessary nursing surgical staff would only admit less than a dozen spectators. Among the latter was Dr. Charles Mayo and several prominent surgeons from eastern Canada and south of the line.

The closing years of the last century and the first decade of the present one witnessed the commencement of that transition in medical practice, *viz.*, the advent of the specialist and the changing status of the general practitioner, so much in evidence to-day, especially in the Coast urban centres. In 1900 Vancouver, with a medical population of about thirty, had one specialist—in fact he was the only one in the province. To-day there are about ninety full specialists or near-specialists in Greater Vancouver with its 300,000 population and three hundred registered practitioners. A generation ago the name of British Columbia, together with its remoteness from the rest of Canada, no doubt was a lure that attracted to the province many of the more enterprising and adventurous recent graduates of the day. In this period, the well trained general man here, as elsewhere, combined in himself, the practice of medicine, surgery and obstetrics, now numbered among the major specialties. In addition to these main branches, there were a number of men well qualified to give splendid service in gynaecology, pædiatrics, orthopædics, ophthalmology, otolaryngology and judged by the standards of the day their results were generally of a high order.

The great distance separating British Columbia from the important medical centres of the east, and the comparative isolation of the various smaller towns within the province, conduced to the development of a self-reliant type of practitioner, compelled by circumstances to depend upon his own judgment in making decisions, and resulting in a relatively high standard of professional ability—adequate to enable him to care successfully for 90 per cent of the ailments of the people served. This type of practitioner remains supreme in British Columbia, taking it as a whole, and even in the Coast cities, where half the population of the province reside and where specialism is more advanced, he is still the mainstay of the bulk of the population. It is an interesting speculation what the next generation will bring forth, particularly in view of the seeming imminence in this province of compulsory health insurance.

Concluded

Association Notes

THE SIXTY-THIRD ANNUAL CONVENTION

The Sixty-third Annual Convention of the Association has come and gone. Meeting, as it did, in the "Queen City" of the Dominion, it was to be expected that it would be eminently successful, not only from the point of view of attendance but also in the quality of the addresses and papers presented. Such, indeed, was the case. For the time being, the Ontario Medical Association united its efforts with those of the national Association, and the result was a large attendance and much enthusiasm. It had been anticipated that about one thousand medical men and their wives would register. As a matter of fact more than fourteen hundred did so. This was most gratifying to the officers and the various committees. The setting of the function, in the Royal York Hotel and in the University, was ideal. Everything passed off smoothly and quickly, and the entertainment provided was delightful.

The exhibits, unfortunately, were much more exiguous than usual. Perhaps this was to be expected, in view of the prevailing financial stress. However, they made up in interest what they lacked in numbers. As usual, the "Hobbies" were of great interest. Notable were the considerable number of paintings, prints and sculptured figures by various members, and there was a good collection of book-plates. Particularly interesting was the collection of old feeding utensils, some of them dating from B.C., exhibited by Dr. Pearl Summerfeldt, and some pewter articles of medical interest, exhibited by Dr.

T. G. H. Drake. Notable also was an exhibit from the Connaught Laboratories, showing the preparation of insulin, and some x-ray pictures of the lungs.

A finely executed series of skin lesions in wax, from McGill University, attracted much attention, as well as some well chosen pathological specimens from Toronto and Queen's Universities.

In the September issue of the *Journal* will appear the various reports that were read to Council, together with the comments and action thereupon, so that it is not necessary here to go into the points brought up in any detail. One or two impressions may be recorded, however.

Health insurance has been studied carefully by a special committee, which has issued a report. It was made clear that sufficient information is available at the present time in regard to the systems in operation in other countries. For ourselves, we have to find out just how adequate medical service is in the various parts of our country, and to what extent the medical profession is being remunerated for its part. Until this is known it will be impossible to recommend any particular scheme.

The fight against cancer is taking shape. The Committee in charge of the study of the cancer question were at immense pains to outline a scheme which might be of practical use in this connection, and their efforts were highly appreciated by the Council, but inasmuch as certain of the provinces had advanced a considerable distance in their cancer campaigns, and were, so far, acting independently, it was not clear how far the Association could assist, unless it were in an advisory or coordinative capacity. The matter required more study.

In regard to the important question of the "one portal to the practice of medicine," whereby it proposed to lessen the number of qualifying examinations set by the universities and the licensing Boards, it was clear that the Council was in favour of simplifying the procedure, so that candidates for medical degrees and licences to practice might be admitted after one examination held before examiners appointed by the various interests concerned. It may be hoped that the efforts put forward in this direction will eventually be crowned with success. Existing conditions are, certainly, not satisfactory.

The two Osler Memorial Scholarships, founded by the Association, with the generous aid of certain citizens of Montréal, were awarded for the first time at this meeting. According to the provisions made when the Scholarships were founded, one candidate is named by the Faculty of Medicine of McGill University and one by the Montreal General Hospital. The recipients are Drs. Gerald Taylor Evans and Gordon Allan Copping, who will pursue special research work.

Dr. Evans was born at Galt, Ont., received his early education there, and his university training at the University of British Columbia, where he

obtained a B.A. degree, and at McGill, where he graduated in medicine last spring with high standing. Winner of numerous awards, including Banting research studentship, he is at present engaged in original research work on the heart muscle at the university clinic in the Royal Victoria Hospital.

Dr. Copping entered the faculty of medicine at McGill in 1925, following study in the arts faculty and graduated in 1930 with high standing. Since graduation he has been a resident at the Montreal General Hospital, doing work under Dr. L. J. Rhea. He will continue his studies at the hospital under Dr. A. H. Gordon and Dr. A. C. Peters at present, planning later to go abroad for further training in internal medicine.

For the first time, too, the Meyers Memorial Prize for essay was allotted, falling to Dr. A. McCausland, Ontario Hospital, Mimico, for his essay on "The Functional Neuroses."

Of more than ordinary interest and usefulness were the corporate luncheons held on the several days of the meeting, at which notable speakers were announced to take part. Sir Arthur Currie was to have spoken at the first of these, but, unfortunately, was prevented by illness. His place was taken by Hon. Dr. Robb, Minister of Health in the Ontario Government, who spoke on the cooperation of the medical man with the public health departments of the country. At the second luncheon the address was given by Sir Robert Falconer, who is just demitting the high office of president of the University of Toronto. We are pleased to see that Sir Robert is not in favour of lengthening the medical course, or of making it more specialistic. He favours a more thorough and broader grounding of the prospective candidates for a medical degree, so as to produce a wider culture and a type of mind better trained to take on the additional load of professional training.

Guests from the United States were Dr. Francis Packard, of Philadelphia, who delivered the Osler Oration, with much acceptance; Dr. George Kosmak, of New York, the Editor of *The American Journal of Obstetrics and Gynecology* who spoke on "Maternal Welfare" at a public evening meeting; and Dr. J. H. Mason Knox, of Baltimore, who spoke on "Infant Welfare" on the same occasion.

The papers in the various Sections commanded a good attendance and were of excellent quality. Our readers will have an opportunity of verifying this for themselves.

The hospitality of the Toronto hosts and hostesses knew no bounds. At the delightful luncheon given by the new President, Dr. Alexander Primrose, to the Council, Dr. A. S. Munro, the retiring President, gave a thoughtful and comprehensive address, by way of valedictory, on "Economic Conditions in Medicine," in which, after careful analysis, he advanced some constructive ideas. This address should be read by all. It can be found on the first page of the July issue of the *Journal*. Doctor Primrose was

then installed as President by Doctor Monro, who decorated him with the beautiful collar of office. Doctor Primrose, on the occasion of the Annual Banquet of the Association, took the opportunity of calling the attention particularly of the newer members of the Association, to the work and aims of the Association, to its achievements in the past and its hopes for the future. This splendid address appears in this issue.

The reception to the members, given by Dr. and Mrs. Primrose in the quadrangle of Hart House, was quite delightful. It was well attended and music was provided by the carillon of the Memorial Tower during the function, a novel and charming feature. Other notable entertainments were Mrs. Primrose's Luncheon and Mrs. Starr's Tea for the wives of the Councillors, and Lady Eaton's Garden Party and Dr. and Mrs. Herbert Bruce's Tea for the members. To all these ladies and gentlemen and to the many private entertainers we return cordial thanks. The visitors have pleasant memories of the occasion.

The next annual meeting will be held in the city of Saint John, New Brunswick, and the President-elect is Dr. G. A. B. Addy.

THE CANADIAN MEDICAL ASSOCIATION*

BY ALEXANDER PRIMROSE, C.B., M.B.,
F.R.C.S., LL.D.,

Toronto

The Canadian Medical Association, an organization national in character, unites the members of the medical profession from all parts of the Dominion in one representative body. Through various agencies the Association performs an important function in keeping its members abreast of the progress of scientific medicine. The Annual Meeting and the Extension Lectures are of great value in that regard. So, too, the *Canadian Medical Association Journal*, one of the best medical publications in existence, exercises an influence of the greatest value. It provides medical literature of the highest type in scientific papers, editorials and other matter, rendering valuable service to the profession in promoting both culture and progress. The *Journal* has done something more. It has carried the fame of Canadian medicine to other countries and has been responsible in no small measure for inculcating that respect for the profession in Canada which we enjoy in the various countries of the world.

During the past ten years there have been three conferences at Ottawa, convened by the Canadian Medical Association under the

* An address delivered by the in-coming President at the Annual Dinner of the Canadian Medical Association, June 23, 1932.

patronage of the federal Minister of Health, for the purpose of discussing the Medical Services in Canada, Public Health, Medical Education and Licensure.

All the various activities of our Association come within the purview of the General Secretary. We wish to express our indebtedness to him for his valued services. It is due largely to his initiative, his flair for effective organization, and his ability in executive detail, that we find ourselves to-day an Association capable in no small measure of moulding the destinies of medicine in Canada.

We tender sincere thanks to our benefactors who have made it possible for us to render national service of the greatest importance to our country. The munificent contributions of the Sun Life Assurance Company have borne the entire cost of our post-graduate lectures and of the Hospital Service Association. The Canada Life Insurance Officers' Association has generously supported the Health Service Department. The people of Canada as well as the Canadian Medical Association are under the greatest obligation to these our benefactors who have provided the opportunity for increased efficiency in the treatment of sick folk throughout the entire extent of this wide Dominion.

In the obituary columns of the *Journal* for the past year we record the losses we have sustained by death among our members. We miss many familiar faces as we express our sorrow and our sympathy with surviving relatives and colleagues. Of recent date we were called upon to mourn the passing of a conspicuous figure in Canadian medicine—Dr. A. D. Blackader who died in Montreal on March 14, 1932. For many years he was an active member of this Association. Through his personal effort as editor of the *Journal* he created a reputation for that publication that received world-wide recognition. Through its columns he made a wonderful contribution to the literature of medicine in Canada, and by so doing he rendered invaluable service to the Canadian Medical Association. As a teacher in McGill University, and as a practitioner in the community in which he lived, he was much esteemed and greatly beloved. We shall not forget the sterling character of the man. Ever alert, and with exceptional power of concentration, he attained conspicuous success in all his undertakings. As a gentleman of the old school, we delight to recall the unfailing courtesy, the kindness and the unselfishness of his attractive personality.

In addition to educational activities to which we have referred the Association deals with a variety of problems that affect both the medical profession and the general public. We find, for example, the following subjects were dis-

cussed by the Council of the Association at its last meeting in Vancouver,— Hospital Service, Public Health, Ethics, Medical Education, Post-Graduate Work, Economics, Inter-provincial Relations, the Nursing Problem, Pharmacy, Maternal Welfare and many other matters. The Association has dealt effectively with Immigration, with Legislation, with professional service to Indians, with the Cancer Problem and with the vast territory of Preventive Medicine. Through its Health Service Department it has broadcast in the press and over the radio instruction to the general public regarding health and disease. It has initiated projects for periodic health examination and health insurance. For the higher qualifications of specialists steps were taken that resulted in the foundation of the Royal College of Physicians and Surgeons of Canada. Through the efforts of the Association, the Royal College of Surgeons of England has conducted the primary fellowship examinations in this country.

A brief but very special reference must be made to the Department of Hospital Service. Since its organization in 1928 the hospitals throughout Canada have profited enormously by the expert advice that is always available from this source regarding many problems respecting hospital construction, administration, equipment, the training of nurses, etc. The hospitals of Canada have been listed and classified in such fashion as to provide a valuable guide to the facilities available for recent graduates in medicine who desire internships. A Canadian hospital council has been inaugurated for the discussion of matters of interprovincial interest. Proposed legislation affecting hospitals is carefully scrutinized. Effective measures have been taken to secure favourable consideration of tariff matters involving hospital economics.

This summary will suffice to indicate the service which is rendered to-day by the Association. Having regard to the work accomplished by this representative group of the medical profession in Canada and to the high national ideals that have ever inspired their efforts, I acknowledge with deep gratitude the great honour that has been conferred upon me by my election to the President's Chair.

The birth of the Canadian Medical Association was coeval with confederation. In fact in 1867, when Dr. Marsden, of Quebec, first suggested its formation, he stated that his proposal was made "in consequence of the important changes that are about to take place in this great and growing country under confederation."

The first regular meeting of the Association was held in the City of Montreal in September, 1868, under the presidency of one of the "Fathers of Confederation," that stalwart "bluenose", the Hon. Dr. Charles Tupper

(afterwards Sir Charles Tupper), a statesman who was destined to play a leading rôle in the development of the united provinces of Canada. In his presidential address Dr. Tupper welcomed his colleagues as "a meeting of members of a profession the most noble, the most unselfish and the most influential of any secular profession or calling."

Our French confrères were the first to establish a medical society in Canada. The Quebec Medical Society was formed by them in 1826. They were also the first to produce a journal—*Le Journal de Médecine de Québec*. Many societies have been formed in different parts of Canada since 1826, but the Canadian Medical Association is the only one that is Dominion-wide in its operation.

The medical profession has formed many close contacts with various organizations throughout the country that have to deal with problems concerning health and disease. It is our Association however that is recognized as the representative of organized medicine in Canada, and as such has been appealed to, both by governments and lay organizations, for leadership when controversial questions concerning the welfare of the community affecting health are under discussion.

Certain organizations are more closely related to the medical profession than others. In no instance is the relationship more intimate than that between the nurse and the doctor. They work together over a common problem—the patient. Effective team work here, to reach its highest efficiency, demands adequate training for nurse and doctor. In 1927 "The Joint Study Committee of the Canadian Medical Association and the Canadian Nurses Association" was organized for the purpose of conducting a survey of Nursing Education in Canada. The Committee was fortunate in securing the services of Prof. George M. Weir, of the University of British Columbia. The survey was begun by him in November, 1929, and completed in July, 1931. The report, a large volume of 591 pages, is published by the University of Toronto Press. It constitutes an exhaustive study of the nursing problem in all its aspects in Canada, and will undoubtedly prove of the greatest value in assisting to solve the many problems that arise in connection with the strenuous effort made at present in this country to establish the highest grade of efficiency and to safeguard the interests of the patient, the doctor, and the nurse.

The nursing problem is at present attracting world-wide attention. In the United States a national commission, composed of representatives of the nursing and medical professions, the hospitals and the general public, has been at work for the past three years studying the nursing situation. Then, again, in England the

report of "The Lancet Commission on Nursing" has just been issued. This commission was appointed in 1930 "to enquire into the reasons for the shortage of candidates, trained and untrained, for nursing the sick in general and special hospitals throughout the country, and to offer suggestions for making the service more attractive to women suitable for this necessary work." It is of interest that the problem in Canada has to deal with a situation in which there is an over-supply of nurses, while in England the reverse is true.

Our Canadian nurses have attained a standard of efficiency in which they may well take pride. Their accomplishments overseas during the war evoked the highest admiration among the allied troops. In peace time we find them occupying high and responsible positions in hospitals both at home and abroad. In view of their attainment it behooves the medical profession to assist, to the limit of their ability, in solving the problems that confront the nurse to-day. It is hoped that, by hearty cooperation of these allied professions, the high standards of education and training already established will be still further advanced, and that graduate nurses will find increased opportunity for effective service. We are justly proud of our Canadian nurse. Let the patient, the doctor and the nurse cooperate in maintaining this service unsullied as one of the finest contributions to the care and welfare of suffering humanity in our time.

We, as an Association, meet in annual session to discuss advances in scientific medicine. In the field of surgery, since the teachings of Lister were universally adopted, progress has been phenomenal. Before his time the abdomen was rarely, if ever, opened by the surgeon; to-day we may safely assume that more operations are performed on the abdominal viscera than on any other part of the body. The surgeon in olden times was occasionally compelled to treat abdominal wounds from which the viscera might protrude. The methods recorded for dealing with such a contingency were often grotesque, in view of our present day knowledge. For example, Mondinus, a famous teacher of anatomy at Bologna in the fourteenth century, occasionally wrote on surgical subjects and in his "Anathomia" occurs a passage regarding abdominal wounds. He states that when the small intestine protrudes with its wall severed the injured bowel must be dealt with. He contends that the small intestine will not stand suturing, and therefore recommends that the lips of the wound should be held together by the hands while large ants are caused to bite the conjoined lips whereupon the heads of the ants are cut off. The intestine, being thus closed, is returned to the abdominal cavity. There is no

mention of a follow-up record in these cases, but we may safely assume that this method of closing the intestinal wound was inadequate.

Very little progress was made in intestinal surgery before Lister's day. His father-in-law, the great Scotch surgeon, Syme, in his "Principles of Surgery," published in 1842, recommended the suture of wounded intestines when they protruded from the abdomen. He used a round sewing needle for the purpose. But in his day the abdominal cavity was never explored for possible lesions of this kind; it was only when the wounded gut protruded that suturing was employed.

A student of the history of medicine will observe that many remedies, the scientific value of which has been proven in recent times, were used in an empirical fashion in ancient days. In a recent article on the evolution of modern surgery I had occasion to note that in medical folklore we have numerous examples of fortunate empiricism where, without intelligent reasoning, remedies were successfully employed in the eradication of disease. Centuries before Lister putrefaction in the tissues was prevented by such methods as the exclusion of air, the prevention of moisture, the use of chemical substances, and the application of heat. There was however, no scientific basis for belief in these remedial measures, and, therefore, no unanimity of opinion as to the potency of this or that method of attack. The quack and the charlatan were often successful where the regular practitioner failed. Inevitable confusion of ideas resulted, and medical men would often employ a large number of remedies in a particular case, hoping, on the principle of the blunderbuss in ancient warfare, that some one of the remedies would prove effective in destroying the demon of disease. Witness, for example, the treatment of Charles II in the seventeenth century. The King was shaving in his bedroom when he suddenly fell back in a convulsion, became unconscious, and died in a few days. The fit may have been of nephritic origin or possibly an arterial embolus in the brain. He was not merely bled and cupped, but an emetic was administered, followed by purgatives. An enema was given containing antimony, sacred bitters, rock salt, mallow leaves, violets, beetroot, camomile flowers, fennel seed, linseed, cinnamon, cardamom seed, saffron, cochineal and aloes. His head was shaved and a blister applied to his scalp. A sneezing powder of bellebore root was administered and a powder of cowslip flowers "to strengthen the brain". White wine, absinthe and anise were given, with extracts of thistle leaves, mint, rue and angelica. A plaster of Burgundy pitch and pigeon dung was applied to the King's feet. Other medicaments contained melon seeds, manna, slippery elm, black

cherry water and extract of flowers of lime, lily of the valley, peony, lavender and dissolved pearls; later gentian root, nutmeg, quinine and cloves. He grew worse, and as an emergency measure forty drops of extract of human skull were administered to allay convulsions. A rallying dose of "Raleigh's antidote" was administered, containing an enormous number of herbs and animal extracts; finally bezoar stone was given. The physician, it is recorded, wished to "have no stone unturned" in his treatment. As the end was approaching, a mixture of Raleigh's antidote mixed with pearl julep and ammonia was poured down the dying King's throat. It is recorded that ultimately he died in exhaustion. (See Haggard, in "Devils, Drugs and Doctors"). The multiplicity of drugs used by the ancients reminds one of the ingredients in the "hell broth" of the witches' cauldron in MacBeth.

Undoubtedly many of the remedies in olden days had little to recommend them, except some far fetched and fanciful belief in their efficacy to cure disease. Monsieur Pomet, chief druggist to Louis XIV, makes the following statement in his "Complete History of Drugs" published in 1737. "The elk is very subject to falling sickness and as soon as he is attacked by the disease, he fails not to put his left foot to his left ear to cure himself thereof; which has given occasion to the ancients to believe that the elk's claw or the horn upon the left foot was a specific for epilepsy."

Organotherapy is a term of recent origin in medical literature. The administration of animal organs in the treatment of disease and to preserve health and vigour is a custom dating back to the earliest days in the history of medicine. Thus, the heart of the lion was eaten with the hope that the traditional bravery of that animal would be transmitted to the consumer. Among savage tribes portions of a dead foe were devoured for similar purposes, or to remove morbid conditions. The writings of such authors as Pomet show that the ancients employed nearly three hundred remedies derived from animal sources, a large proportion of them being in vogue before the days of Hippocrates.

For many years it was believed that the administration of the healthy organs of animals would restore health in human beings when similar organs were diseased. Thus extract of kidneys in kidney disease, extract of brain in languor and apathy, pancreas in diabetes and supra-renal extract in Addison's disease were advocated. Lauder Brunton gave raw meat in the treatment of diabetes. The testicular extract of Brown-Séquard, largely because of the eminence of its proponent, attained a reputation for general malnutrition and weakness.

Thyroid extract was successfully used in myxedema. The Bushmen of South Africa after killing a venomous snake would swallow its poison in order to create immunity from its effects. This is an excellent example of empiricism. The practice was considered by T. R. Fraser, of Edinburgh, an outstanding authority of his time on snake poison, as of no mean value in accomplishing its purpose. At the present time organotherapy is employed when the experimental and clinical evidence demonstrates its value. Outstanding examples are found in the use of insulin in diabetes and liver extract in pernicious anæmia. We might cite also the recognized therapeutic value of extract of the pituitary body, the adrenal, and the thyroid gland.

The intensive study of biochemistry in recent years has well nigh revolutionized the practice of medicine and our conception of the etiology of disease. Formerly our attention was concentrated on the morbid changes found in individual organs after death or in tissues removed during operation. Nowadays, we regard the body fluids as primary factors in the incidence of disease. The principles upon which the employment of blood transfusion and serum therapy is based have been evolved from an intensive study of the chemical and morphological constituents of these fluids. Yet even in the days of Hippocrates there was an inkling of the truth in the promulgation of the humoral theory of disease. For many centuries the doctrine of the four humours was universally accepted. Accurate observation was the sole avenue of approach in solving the problems of disease. The experimental method came with the advent of Harvey (1578-1657). But the Hippocratic school studied the problem as it lay in the individual patient upon whom all energy was expended in observing the phenomena of disease and in interpreting the etiology of the malady in terms of humoral dyscrasia. It was recognized that in the individual patient you had not only an active process proper to the disease but an antagonistic process equally active, that is, the effort made to cope with and throw out the demon of the distemper. The latter was recognized as the effort on Nature's part to meet the situation. The ancients had the greatest respect for the *vis medicatrix naturæ*. The analogy that may readily be established between these Hippocratic doctrines and the ultra-modern view of disease and its treatment has led to a revival of interest in the methods of the ancients. In fact the modern physician holding these views has been called the neo-humorist. Robert Hutchison would describe his creed as neo-Hippocratism.

My object in referring to these historical facts is to emphasize the important rôle played

by the Canadian Medical Association in using its various agencies, the *Journal*, the Extension Lectures and the Annual Meeting, to further the progress of scientific medicine. It is not only necessary to use these means for the purpose of assessing the value of new discovery but it is equally important to study the history of our art. We learn much by careful scrutiny of the methods of treatment employed through the ages. Occasionally we find that the creed of the ancients had a modicum of truth, and our modern therapy, based on the scientific proof of its efficacy, is often the employment of methods used by our predecessors in an empirical fashion. Again modern clinical and laboratory investigation may prove the futility or harmfulness of certain methods of treatment sanctioned in ancient usage. Even the ludicrous method of treating Charles II by employing a multiplicity of drugs has its lesson for the twentieth century. In a modified form similar methods are occasionally employed. To-day we stand aghast at the haphazard manner in which drugs are occasionally prescribed. Aye! even operations are performed without an adequate conception of the effect that may be anticipated on the animal organism. In this age we hope for an ever increasing scientific precision in determining treatment, greater accuracy in assessing values, with the alluring prospect that eventually the maximum amount of benefit will be secured for suffering humanity.

As a national association we should note outstanding achievements in the history of medicine as recognized in anniversary celebrations. It is fitting that we should pay our tribute to the memory of great men in medical history. This year in the Robert Koch Institute in Berlin was commemorated the fiftieth anniversary of Koch's discovery of the tubercle bacillus. On March 24, 1882, he announced his discovery to the Berlin Physiological Society. Robert Koch (1843-1910) is accorded a place beside Pasteur as one of the founders of Bacteriology. In 1876 he published his observations regarding the anthrax bacillus. Cohn as early as 1857 had discovered the sporulation of microscopic organisms, but Koch traced the development of spores into the typical anthrax bacillus. By cultivation of the organisms and by experiment he proved that the *Bacillus anthracis* was the cause of splenic fever. As leader of the German Cholera Commission in 1883 he recognized the amoeba as the cause of dysentery and the comma bacillus as the cause of Asiatic cholera. His chief claim to fame, however, was the demonstration fifty years ago of the bacillus of tubercle. The far-reaching effect of this epochal discovery is a matter of history. It was the first lucid and convincing proof of the causal relationship

existing between bacteria and communicable disease.

The centenary of Goethe's death (March 22, 1832) is being celebrated this year. It has been said of him that "if we except perhaps Leonardo da Vinci, he was the most versatile and comprehensive of geniuses." He was poet, dramatist, novelist, a precursor of the evolutionists, an orientalist, a theatrical director and a statesman. He wrote the immortal first part of Faust. Further, I may remind you that he discovered the intermaxillary bone of the upper jaw in man. In that respect it was claimed man differed from the ape and all other vertebrate animals. Because of his scientific achievement we may legitimately claim him as worthy of our recognition to-day.

The centenary of the death of Cuvier, the greatest of the French comparative anatomists, was celebrated last month in various parts of France. The name of Cuvier is known to every student of anatomy and embryology. Certain veins entering the heart in the embryonic state are still designated "the ducts of Cuvier." He is regarded also as the founder of Palæontology.

The vicissitudes of modern life, particularly in this period of universal economic distress, cause anxiety for the continued stability and permanence of our institutions. At the moment our Association is fortunate in being able to maintain efficiency in its operations. It is true our members are embarrassed and often burdened with financial worries. The Executive Committee and the Council are grateful for the loyal and unselfish support of the profession throughout Canada. In spite of distress and shrinking incomes, medical men and women are striving to preserve ideals. The Canadian Medical Association, through the effort of its members and the generous support of its benefactors, is accomplishing work of supreme value in securing the highest type of medical service for the community. It is a nation-wide undertaking. We are proud of our accomplishment. Our objective is to insure the maximum degree of efficiency in the relief of human suffering.

Many who have themselves but little skill

To shape their course where peril may accrue
Avert full oft the greater share of ill

Who take example from what others do.

For Youth, than this, there is no better school;

For Men, no milder discipline and rule,

Than well t'observe and weigh with prudent care
The acts of others from the fruit they bear.

—Richard Pigot.

Hospital Service Department Notes

THE HOSPITAL CRISIS IN TORONTO

The hospitals of Toronto are facing what has been described as "the gravest crisis in their history". Varying deficits amounting to \$171,942 have been reported by the various public hospitals and the Board of Control of the city has departed from the custom of previous years and has refused to meet these deficits. The public hospitals in Toronto are under private boards of leading citizens, although the majority of these boards include city representatives, and if the city maintains its decision to refuse further aid the hospitals will be in a serious plight. The situation is due to a condition common to every province of Canada; namely, that the municipal and provincial grants to hospitals fall far short of the actual cost of indigent care. Obviously, these deficits are incurred on the public wards, and failure of municipalities to meet their just obligations and of provincial governments to protect hospitals with adequate legislation will tend to make the task of private Boards of Management so utterly impossible that there is a grave danger that the public-spirited citizens who comprise these boards will refuse in the future to give so freely of their energy and means to an unappreciative public, and force the municipalities to operate these public ward services themselves. Those municipalities with civic or municipal hospitals do meet these deficits now, and the present serious predicament of our privately managed public hospitals may hasten the extension of this movement.

The various hospital leaders have made most emphatic protest and their just claims have been backed by editorial support in the press. The Hospital for Sick Children, with a deficit of \$86,283, is particularly hard hit, and in this hospital 95 per cent of the patients are in the public wards. As the city does not dare force the closing of its hospitals, it is anticipated that these deficits will be met when the grandstand play of the "City Fathers" will have served its publicity purpose, but it does seem unjustifiable in this age that altruistic citizens who comprise these trustee boards should be forced, not only in Toronto but in nearly every other centre in Canada, to beg year after year for the hospitals' just recompense for assuming obligations which are really those of the general public.

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.

THE ONTARIO CONFERENCE OF THE CATHOLIC HOSPITAL ASSOCIATION

The first convention of the Ontario Conference of the Catholic Hospital Association was held at the University of Ottawa in April. Organized last autumn, this association is made up of the various Sisters' hospitals in Ontario, and among the two hundred delegates were representatives from such distant points as Port Arthur, Sault Ste. Marie and Windsor. Delegates were present also from Montreal and Quebec.

A number of varied hospital topics were discussed in a general session at which Dr. Albert Charlebois presided. Perhaps the chief topic under consideration was that of nursing education, at which session the President, Sister Madeleine of Jesus, R.N., of Ottawa, presided. Miss Isabelle McElroy, of Ottawa, Sister Felicitas, of North Bay, Sister Melanie, of Port Arthur, the Rev. G. Marchand, of Ottawa, Sister Champion, of Kingston, and Dr. Harvey Agnew spoke on this subject. At the excellent banquet which was tendered to the delegates by Sister Josephat and her associates at the Ottawa General Hospital, addresses were given by the Hon. Dr. J. L. Chabot, Col. Casgrain, of Windsor, President-elect of the Ontario Hospital Association, Dr. R. Chevrier, Mr. M. R. Kneiff, St. Louis, and others. Dr. J. C. Woods, of Ottawa, brought the greetings of the medical profession.

Among the resolutions passed was one expressing regret that the Federal Government has had to discontinue its grant for the maintenance of Venereal Disease Clinics, and one expressing the thanks and gratitude of the Conference to the Sun Life Assurance Company of Canada for its interest in and material assistance to hospitals and hospital undertakings.

THE NEW HOSPITAL FOR INCURABLES AT OTTAWA

Information has been received that the Grey Nuns of the Holy Cross, now operating the General Hospital on Water Street, Ottawa, have purchased the Misericordia Hospital, better known as St. Mary's Hospital, which will now cease to operate as a general hospital and be converted into a home for incurables. This conversion for the use of a special type of patient is in keeping with the present movement in hospital construction and operation, as most communities, the larger ones especially, have a sufficient number of general hospitals but fail lamentably to provide for those patients which ordinarily are not admitted to general hospitals. There is a growing conviction among health workers in our Dominion that each community should pay more atten-

tion to the provision of hospital accommodation for the chronically ill, for the incurable, the convalescent, the alcoholic, the drug addict, the mildly demented and other types of patients. Canada, with the possible exception of the Province of Quebec, is woefully lacking in accommodation for incurable patients. While Ottawa, with the Perley Home for Incurables and the St. Vincent Home for Incurables, is already better situated than almost any other centre in Canada, the addition of this extra accommodation will be much appreciated and will be fully utilized without doubt, for the present accommodation, as in other cities where incurable hospitals are located, is badly overcrowded.

The hospital is a modern fire-proof four-story structure, which was added some four years ago as an addition to the older building, now used as a mothers' and infants' home. There is accommodation for some 125 patients.

Provincial Association Notes

THE FIFTY-SECOND ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION, HELD IN CONJUNCTION WITH THE ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, TORONTO

JUNE 20, 21, 22, 23 and 24, 1932.

The Convention of the week of June 20th was a great success when measured by program, attendance, good fellowship and delightful weather.

Registration was very gratifying, the numbers being, physicians, 949; guests and visitors, 476; total, 1,425.

Both in the general sessions and scientific sections, the program was of a very high order.

Delightful garden parties were given by Dr. and Mrs. Primrose at Hart House Quadrangle on Wednesday afternoon; and by Lady Eaton at "Ardwold" on Thursday afternoon; while Dr. and Mrs. H. A. Bruce entertained at afternoon tea on Friday.

The Osler Oration preceded by a musicale drew five hundred people to Convocation Hall on Wednesday night.

The annual dinner dance held at the Royal York Hotel on Thursday proved to be an outstanding success, with close upon six hundred in attendance.

COMMITTEE ON GENERAL PURPOSES

On Tuesday afternoon, the Committee on General Purposes of the Association held the best attended meeting of that Committee in the

history of the Association. Eighty-nine members answered the roll call from the following counties: Essex, Kent, Elgin, Lambton, Middlesex, Brant, Waterloo, Wellington, Oxford, Perth, Huron, Norfolk, Grey, Haldimand, Lincoln, Welland, Wentworth, Halton, Peel, York, City of Toronto, Ontario, Simcoe, Victoria, Peterborough, Durham, Northumberland, Prince Edward, Hastings, Frontenac, Leeds, Grenville, Carleton, Glengarry, Stormont, Nipissing, Muskoka, Thunder Bay. Only six County Societies were not represented at the meeting.

At the opening of the business session, Dr. J. H. Elliott, on behalf of Dr. John Ferguson, who was ill, presented a beautiful gavel to the Association. The Committee duly recorded its appreciation and thanks to Dr. Ferguson, expressing the hope for his speedy and complete recovery. The afternoon was taken up in transacting the business as recorded in the reports, copies of which have been mailed to every doctor in Ontario.

ROUND TABLE CONFERENCE

On Tuesday night, the Round Table Conference, following the dinner at which 200 were present, discussed the report of the Committee on Inter-Relations. The meeting adjourned at midnight, having recommended that a Committee be appointed to correlate the opinions expressed at the dinner. The complete report of the Committee on Inter-Relations will also be found in the printed reports mailed to every doctor in Ontario.

ELECTION OF OFFICERS

On Wednesday, the Association elected the following as its officers for the ensuing year:—

President, Dr. J. H. Holbrook, Hamilton; *First Vice-President*, Dr. F. C. Neal, Peterborough; *Second Vice-President*, Dr. A. J. McGanity, Kitchener; *Secretary*, Dr. T. C. Routley, Toronto; *Honorary-Treasurer*, Dr. G. Stewart Cameron, Peterborough.

Counsellors.—District No. 1, Dr. Geo. A. Ramsay, London; No. 2, Dr. W. A. McIntosh, Simcoe; No. 3, Dr. R. Howey, Owen Sound; No. 4, Dr. W. K. Colbeck, Welland; No. 5A, Dr. Ira Freel, Stouffville; No. 5B, Dr. A. J. Mackenzie, Toronto; No. 6, Dr. Geo. Stobie, Belleville; No. 7, Dr. W. A. Jones, Kingston; No. 8, Dr. R. K. Paterson, Ottawa; No. 9, Dr. A. H. McMurchy, North Bay; No. 10, Dr. J. C. Gillie, Fort William.

On the invitation of the Hamilton Academy of Medicine, it was decided to hold the fifty-third annual meeting in the City of Hamilton on May 30, 31, June 1 and 2, 1933.

LIFE MEMBERSHIP

The Association heartily endorsed the recommendation of the Nominating Committee that Life Membership be granted to the following:—Dr. D. J. Gibb Wishart, Toronto; Dr. George

Bowman, Penetanguishene; Dr. A. Dalton Smith, Mitchell.

DISTRICT MEETINGS

Tentative arrangements were agreed upon for the places and dates of the annual District Meetings to be held this autumn, as follows:—

District No. 1, October 5th, Chatham; No. 2, September 28th, Galt; No. 3, October 12th, Owen Sound; No. 4, October 26th, Hamilton; No. 5A, October 6th, Stouffville; No. 5B, in November, Toronto; No. 6, September 29th, Belleville; No. 7, October 7th, Kingston (?); No. 8, in October, Ottawa; No. 9, September 5th, Sudbury; No. 10, September 7th, Port Arthur and Fort William.

The following Chairmen of Committees were appointed for the ensuing year:—

<i>Benefit Fund</i>	Honorary-Chairman, Dr. John Ferguson, Toronto; Chairman, Dr. L. J. Austin, Kingston.
<i>Editorial Board</i>	Dr. J. H. Elliott, Toronto.
<i>Credentials and Ethics</i>	Dr. H. C. Wales, Toronto.
<i>Education</i>	Dr. Geo. C. Hale, London.
<i>History of Medicine</i>	Dr. I. E. Crack, Hamilton.
<i>Inter-relations</i>	Dr. A. J. McGanity, Kitchener.
<i>Legislation</i>	Dr. Harris McPhedran, Toronto.
<i>Mental Hygiene</i>	Dr. G. A. McLarty, Toronto.
<i>Necrology</i>	Dr. J. H. Elliott, Toronto.
<i>Tariff</i>	Dr. Jas. McQueen, Galt.
<i>Workmen's Compensation Board</i>	Dr. M. H. V. Cameron, Toronto.

Representatives on the Joint Advisory Committee:—Drs. J. H. Holbrook, Hamilton; G. Stewart Cameron, Peterborough; A. J. Mackenzie, Toronto; T. C. Routley, Toronto.

Considering the general economic situation all over Canada, the attendance was several hundred in excess of what had been anticipated. It was mentioned at the outset of this report that the meeting was a great success. This, in large measure, was attributable to the Committee which was in charge, representing both the men and the women. It might be mentioned, too, that the facilities of the Royal York Hotel, Toronto, contributed in no small degree to the general success of the event.

“Among the circumstances which cause the hearts of the people to turn away from the reputable physician is the delusion that the medical man should know everything and ask no questions. If he inspects the urine, or feels the pulse, he is supposed to know what the patient has eaten and what he has been doing. I myself, when I began to practise medicine, had resolved to ask no questions when the urine had been given me, and had been much honoured. Later, when it was seen that I had made circumstantial enquiries, my reputation sank.”—*Rhazes*.

Medical Societies

THE EASTERN SASKATCHEWAN MEDICAL SOCIETY

A meeting of the Eastern Saskatchewan Medical Society was held in Broadview on June 21. Dr. G. H. Craig presided. There was a gratifying attendance, as it was the most largely attended meeting ever held by this society, there being about 30 medical men present.

The speakers were: Dr. W. F. Gillespie, Professor of Surgery in the University of Alberta, Edmonton, and Dr. E. P. Scarlett, specialist in abdominal diseases in Calgary, Alta. The meeting was also addressed by Dr. J. J. Wall, Vienna eye specialist, on the trachoma situation on the Indian reserves. The work of treating this disease was undertaken by the Dominion government. Dr. Wall demonstrated to his audience 18 cases of well defined trachoma in all its stages, showing the terrible ravages of the disease when not adequately treated.

At the business meeting which followed, the following officers were elected for the ensuing year:—*Honorary President*, Hon. F. D. Munro; *President*, Dr. Clements, Wawota; *Vice-President*, Dr. Cook, Wolseley; *Secretary-Treasurer*, Dr. J. A. Keyes, Wapella.

THE WINNIPEG MEDICAL SOCIETY

At the annual meeting of the Winnipeg Medical Society, held May 20th, 1932, the following officers were elected for the 1932-33 season: *President*, Dr. F. J. Hart; *Vice-President*, Dr. W. W. Musgrove; *Secretary*, Dr. O. C. Trainor; *Treasurer*, Dr. O. J. Day; *Trustee* (3 years), Dr. A. P. MacKinnon.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

The Ophthalmological Society of the United Kingdom held its Annual Congress for 1932 in Edinburgh on May 12th, 13th and 14th. The meeting was largely attended by members from all over the United Kingdom. Dr. Arthur H. H. Sinclair, President of the Society, delivered the Opening Address. The address which was on the subject of "Intracapsular extraction of cataract," dealt with the technique of the operation, its advantages in immature cataract, and its dangers and difficulties. The statistics of over 300 cases of intracapsular extraction were presented. The Bowman Lecture was delivered by Professor J. van der Hoeve, of Leyden; on the subject of "Ocular movements." The Annual Banquet was held in the

evening of the 12th at the Royal College of Surgeons, when a large gathering sat down to dinner. Among those present were Sir George Berry, Sir Richard Cruise, Sir William Lister, Sir Arnold Lawson, Mr. Treacher Collins, Mr. Herbert Fisher, Dr. Maitland Ramsay and Dr. George Mackay. The guests of the Society included the Bowman Lecturer (Prof. van der Hoeve), the President of the Royal College of Surgeons (Mr. J. W. Dowden), the Dean of the Faculty of Medicine (Professor Sydney Smith). The three days of the meeting were fully occupied by a varied and interesting program. At the morning and afternoon sessions of the Society many important papers were read. An excellent museum of exhibits of ophthalmological interest was arranged by the Museum Committee, under the convenorship of Miss Ida Mann, and was much appreciated by the members of the Society.

The calendar of the Edinburgh Post-Graduate Courses in Medicine has now been issued. These are held chiefly during the months of the vacation—July, August and September. There are three main courses of study. A course in obstetrics, gynaecology and diseases of children will be held from July 11th to August 6th. A general practitioners' course and a general surgical course run concurrently from August 15th to September 10th. The practitioners' course includes clinical medicine and surgery, infectious diseases, gynaecology, diseases of children, eye, ear, nose and throat. In addition to the courses given under the auspices of the Post-Graduate Committee, the following post-graduate courses are regularly provided by the university during the ordinary university terms: entomology and parasitology, diseases of tropical climates, psychology and experimental psychology, bacteriology, neurology, chemical physiology, laboratory methods in medicine, applied anatomy and surgical pathology. Courses of instruction for the university diplomas in tropical medicine and hygiene, psychiatry, public health and radiology are also given.

The Gynaecological Visiting Society met in Edinburgh on Monday and Tuesday, June 6th and 7th, under the presidency of Prof. R. W. Johnstone. In the mornings the members were present at operations performed by Drs. Johnstone, Young, Haultain and Miller. On the Monday afternoon a visit was paid to the Animal Genetics Department of the University. There demonstrations were given by Professor Crew, Dr. Wiesner, Dr. Robson, and other workers on sex-hormones and allied subjects. In the evening the Society dined in the Hall of the Royal College of Physicians. This Club of Gynaecologists in Great Britain and Ireland was founded twenty-two years ago. It meets once or twice a year in one of the centres

where it has members. On occasion, visits are made to the mainland of Europe to see the work of continental gynaecologists. It was due to the activities of Professor Blair Bell, of Liverpool, that the club was originated. Last year, on the occasion of the twenty-first birthday of the Club, Professor Bell was presented by the members with his portrait by Sir William Rothenstein.

The Harveian Festival was held in the Royal College of Physicians on June 3rd. Dr. J. Haig Ferguson, President of the Society, was in the chair. This was the 150th anniversary of the foundation of what is the oldest Harveian Society in the world. It was founded through the enterprise of Dr. Andrew Duncan, in the year 1782. The President gave the Harveian Oration. Later the Society dined in the Hall of the College, when the President proposed "the Immortal Memory of William Harvey."

Sir Ashley W. Mackintosh, F.R.C.P.E., Emeritus Professor of Medicine at Aberdeen University, has been presented with his portrait and a sum of £1,000. The portrait is the work of Mr. John Souter, an Aberdeen artist, now resident in London. Sir Ashley has handed over the £1,000 to the university, to be devoted to the assistance of students of any of the faculties in times of sickness.

The Liston Victoria Jubilee Prize of the Royal College of Surgeons of Edinburgh, instituted in 1887 by Dr. Robert Halliday Gunning, and awarded triennially for the greatest benefit done to practical surgery by a Fellow or Licentiate of the College, has been awarded to Norman M'Omish Dott, F.R.C.S. Edin.

Leave of absence during part of the winter and spring terms of the academic year 1932-33 has been granted to Professor J. J. R. Macleod of the Chair of Physiology at Aberdeen University, to enable him to accept the post of Visiting Professor of Physiology at Johns Hopkins University, and to deliver a course of lectures there.

American students attending Edinburgh University gave a vaudeville entertainment in aid of the Royal Infirmary in the New Victoria Cinema on three evenings last week, and as a result of the collection taken, a sum of £67 was ingathered.

The Annual Golf Match between the Royal College of Physicians and Surgeons was played at Luffness Golf Club on Wednesday, May 18th, when the Surgeons were victorious by 17 to 5. At the dinner which was held in the Clubhouse in the evening, Sir Harold Stiles, Emeritus Professor of Clinical Surgery presided.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

It has been pointed out before in these notes that mental deficiency presents a real and urgent problem in this country. It has been estimated that there are 300,000 "socially inefficient children and adults" in England and Wales, that is 8 per thousand of the population. The striking phrase quoted above is taken from an excellent report by the Mental Deficiency Committee of the British Medical Association, just issued. Recognizing from the outset that the condition must be regarded as incurable, the Committee has given up its time to the great problem of the prevention of mental deficiency and, to a lesser extent, the management of mental defectives. Closely connected with the former is the question of causation and here the Committee reaches some wise but guarded conclusions. It is asserted that heredity plays no definitely simple part, in general terms, but the evidence is stated to be insufficient and an interesting suggestion is made that in the form for the registration for marriages there should be a column for a statement of any family or blood relationship existing between the contracting parties. The causation of secondary amentia is clearly discussed in its relation to prevention, and next comes an important statement regarding the prevention of transmission of the defect from generation to generation in the hereditary form of mental deficiency. The Committee considers, in the present state of knowledge, that sterilization, even widely applied to mental defectives, would cause no appreciable difference in the number of such in the community for many generations. Research is urgently recommended into this and many other aspects of the subject, and it is interesting to note that the whole question of sterilization of the unfit is now to be made the object of an inquiry by an official governmental body. This is probably the direct result of a bill introduced a short while ago into Parliament by Major Church, and of a recent conference arranged by the Eugenics Society to expound the views urged for many years by this society on what is termed voluntary eugenic sterilization. It is probable that the views then expressed are a long way ahead of public opinion, but no doubt the new commission will be able to elucidate clear notions on what is really thought about what at first sight appears to most people an unpardonable infringement of personal liberty.

The maternity mortality rate has more than once been referred to in the last few years as a subject demanding urgent attention. An attempt to get at the root of the matter, which in

this case is the uncomfortable feeling that the general practitioner is not as good as he should be at this part of his daily work, was made recently in London when a junior's evening of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine was devoted to an airing of views by registrars and tutors on the subject of the teaching of obstetrics. It was agreed by most teachers that the object of such teaching was to turn out doctors imbued with the principles of preventive medicine, as exemplified in ante-natal supervision; efficient in the management of normal labour and common emergencies; and knowing how to adapt domiciliary surroundings into an attempt at surgical cleanliness. The necessity for at least two months' residence was strongly urged, and many practical points on the instruction of the students in the management of the lying-in mother, especially as regards the establishment of breast-feeding, were stressed. Some speakers complained that as juniors their work was not sufficiently encouraged by the senior visiting staff, who appeared only too rarely in the labour room, and there was general agreement that in all institutions of sufficient size there should be a resident director. Altogether, the evening left a note of optimism that the teaching of the coming generation of students was in good hands, and granted some measure of reorganization of the available material future doctors should be better midwives than their fathers.

The Princess Royal recently visited Tadworth, in Surrey, to open a new pavilion at the country branch of the Hospital for Sick Children, Great Ormond Street. This was the first visit of Her Royal Highness to this branch of her own hospital for she was trained as a nurse at the central establishment. Five years ago the hospital secured an extensive country estate and it aims at a big branch to which children can be transferred as early as possible from the town building which will in time serve merely as a sorting and emergency centre. The house at Tadworth accommodates thirty-five patients and the new pavilion another forty. A series of such pavilions is planned for the future and the most up-to-date principles of hospital planning have been applied to the first of these. It is a matter which should interest readers of this letter that the floor coverings of the wards and day-rooms are of Canadian maple and it is hoped that Canadian visitors will tread these boards as they have so often trodden the new well-known floors of the parent hospital.

ALAN MONCRIEFF

London, July, 1932.

Topics of Current Interest

Health of Animals

Satisfactory progress continues to be made in the control of bovine tuberculosis. During the past year approximately 450 additional herds were accredited, increasing the total of our fully accredited herds to 5,450, with approximately 164,000 fully accredited cattle. Not less than 1,250 new herds have been accepted, and the majority of them are now undergoing accreditation. There is not now, as in the past, the same hesitation to place herds under the Department's other single herd policy, known as the supervised herd plan, even though reactors are slaughtered under that plan and no compensation is paid for them. This attitude on the part of the live stock owner is in a large measure due to the fact that there is little demand to-day for untested dairy cattle and their products. Cattle owners unable to meet the entry requirements under the accredited herd plan, unless located in a restricted area, have consequently found it in their best interests to take advantage of the supervised herd plan. More herds have been entered under this plan during the past year than during the lengthy period intervening since the adoption of this plan in 1903. The demand for the extension of existing areas and the establishment of additional ones continues, and this has necessitated the employment of every available inspector. Although every effort has been made to conduct this work expeditiously it has not been possible to satisfy the demand. This work is accumulative because every new herd becomes a permanent liability, and must be retested at suitable intervals.

This work takes up the time of inspectors who would otherwise be available for the conduct of initial tests of new herds. It is consequently, with our limited resources, very largely self-limiting work, but as the infection in areas is reduced to practical limits of one-half of one per cent, and less, much longer periods can with reasonable safety be permitted to elapse between tests. This permits employing inspectors in testing new herds who would otherwise be engaged in the conduct of retests. It is, however, fully realized that permanent progress can only be made by paying constant attention to areas in which the infection has been reduced, and that the acceptance of new herds and areas must be limited in so far as it will not necessitate neglecting the work already undertaken.

The control of tuberculosis is now a very live question among live stock owners in this country, and this attitude is undoubtedly due to the fact that it has been possible to demon-

strate to them that the control and elimination of bovine tuberculosis by successive tuberculin tests, the slaughter of reacting cattle, and the cleansing and disinfection of premises, constitute a practical and profitable procedure.

The percentage of infection in districts at initial tests has been found to vary very considerably, and has ranged from less than 1 to 28.72 per cent. The maximum annual sum paid in compensation since the inception of our compensation policies in 1915 was reached in the fiscal year ending March 31, 1931, when it involved the payment of \$1,370,000 for approximately 45,000 reacting cattle. This abnormal expenditure was not due to an abnormal increase in the number of cattle tested, but to an abnormally high percentage of infection encountered in a few counties in which approximately 50 per cent of the herds were found to be infected. These badly infected districts were uncovered without the slightest warning during the latter part of that fiscal period, after experiencing a normal incidence of the infection during the preceding months of that year.

The total number of cattle in restricted areas throughout the Dominion is now approximately 1,510,600, and of this number more than 1,200,000 have been tested at least once, and many of them more frequently. Experience in restricted area work has shown, contrary to general belief, that although many reactors may be slaughtered the total number of cattle in an area soon increases through replacements. Our general retests of all herds in an area invariably show a substantial increase in the total number of cattle in areas when compared with the total number found at the initial general test.—In Abs. from the *Bull. Canad. Tuber. Ass.*, 1932, 10: No. 3, p. 6.

Royal College of Physicians and Surgeons of Canada

In the days of long ago in Canada practically every doctor began life as a general practitioner. As practice developed he began to discover that he was more interested in one line than in another. As soon as his purse began to show signs of bulging, he would go abroad to do some intensive post-graduate study and practical work in his chosen specialty, returning to work as a "specialist."

In later years students have frequently decided during their college course what is to be their chosen line, whether fitted for it or not. Upon graduating they begin their future training for this special work by trying for a hospital post in some special course. Failing this, they proceed to some large clinic as onlookers for from two weeks to three months, endeavour-

ing to learn "more and more about less and less."

The question of improving the state of affairs has been under consideration by the Canadian Medical Association for many years, culminating in the formation of the Royal College of Physicians and Surgeons in June, 1929, when the College received a Royal Charter.

It is proposed that the standard of examination for the College shall be of the highest, and that the diploma obtained will stand for the best that is to be found in medicine, surgery and its allied branches.

It is important that students should take the primary examination during their college course, when their anatomy and physiology are still fresh in their minds. Then, when a few years later they have decided upon the line of work they intend to follow, they will be in a position to seek the diploma by taking the Final Examination. It is hoped that the various universities in the Dominion will arrange intensive courses of study in order to prepare their undergraduates, as well as their graduates, for these examinations.—DR. F. N. G. STARR, *President*.

Lunatic Hue

M. Poiret, the famous French dress designer, has been called in by the French asylum authorities. He is to devise fashions for lunatics and the kind of garments that will look well with straw. Medical men can give him a good deal to go on, for their testimony is that drab hues are bad and that lunatics are happiest in brightly variegated patterns. But it is possible that the dressmaking world will look askance at M. Poiret's new activities. It might, of course, be a recommendation of particular colours and patterns that they had been proved in the asylums to have high tonic values, and "Broadmoor pink" or "Rampton yellow" ought to take high rank among colours of proved merit. But customers are queer, and there can be no certainty that things would work out like that. Husbands who already think that their wives are not quite normal, and are even dangerously unbalanced, about clothes and their importance in human life, will find themselves pitifully caught in a cleft stick if the more gorgeous and fantastic garments can always be excused on the ground that they conduce to sanity and are an insurance against the more depressing forms of mania. Doctors who rise to fashionable practices, and succeed by giving medical backing to the fancies of wives for particular holidays or particular eatables, will now be able to prescribe clothes. To go shopping has long established itself as a cure for feminine depression, and it has not needed any study of psychological text-books to make a new hat an antidote for worry. When once it is authori-

tatively established that clothes matter for the mind, the draper's case against the husband will be greatly strengthened.

Married men, in short, are faced with an intensification of their worries, and therein lies the tailor's chance. If it is bad for lunatics to have unexciting patterns and drab hues for their clothing it cannot be good for harassed business men. It is the plainest folly, itself almost up to asylum standard, for men to go to their offices clad in the garments of depression, and only to begin cheering themselves up through their clothes when they have been formally certified, instead of wearing the bright colours of sanity before they have grown ripe for lunatic status. There still exists a prejudice against loudly dressed persons, especially in banking circles. But the waistcoat of the howling cad takes on a different complexion when it is looked on as medicine, the gilded pill of the provident man who takes his brightness, applied externally, before and not after the black coat has been allowed to work its evil effect.—*The Weekly Times*, Dec. 31, 1931.

Movable Dwellings, Campers and Camping Grounds

In the interests of health and good order, as well as of social and natural amenities, the Surrey Act has some striking novel provisions as to movable dwellings and camping grounds. Local legislation as to dwellers in tents and vans has been increasing in intensity in the past few years in England. Surrey now gives a lead as to campers and camping. In Surrey "movable dwelling" will include a cart, carriage, truck, tramcar, motor-car, caravan, trailer, or other vehicle used or intended to be used for human habitation, temporary or otherwise. On complaint of the local authority, a court of summary jurisdiction may prohibit movable dwellings in any area to protect local amenities or to save residents or visitors annoyance from noisy, indecent, or other offensive conduct. The local authority may itself provide (and temporarily close) camping grounds, and may make by-laws as to any camping grounds in its district in the interests of proper control, cleanliness, amenities, orderly conduct, or the prevention of annoyance. We may expect such provisions as these to be imitated and elaborated elsewhere in future.—*The Lancet*, 1932, 1: 51.

All men have their trials and afflictions, but a contented mind accommodates itself to every vicissitude of life; neither poverty nor distress, neither losses nor disappointments, neither sickness nor sorrow, can affect its equanimity.—Dr. Brewer.

Medico-Legal

LEGAL JOCKEYING WITH THE WORKMAN

The principle of a workman's special right to compensation when injured or disabled in an accident has been sanctified in so many countries that it was inevitable that our Province (Quebec) should fall in line with the enactment of proper legislation. In 1907 a Commission of Inquiry was appointed by the Provincial Government, and it was as the result of its report that the Workmen's Compensation Act of 1909 was passed,—an Act that for the first time frankly accepted the then new principle of "professional risk".

Under the old principle of common law: "quæ sine culpa accident a nullo præstantur": the workman had to prove fault against his employer or the latter's subordinate to obtain compensation for injury in an accident. Statistics compiled near the close of the last century disclosed that of all accidents to workmen, fully 68 per cent were due to fortuitous events or unknown causes, since the rapid development of machine and workshop labour brought with it new and hitherto unknown risks and created new agencies for destruction.

Hence the need for new legislation to cope with heightened labour risks, and the Act of 1909 was accordingly based on the accepted principle that every workman was entitled to compensation for injury by accident in the course of his work, apart from whether the accident was caused by any fault on the part of his employer. The workman no longer had to prove fault, but had to establish that his disability resulted from an accident happening to him in the course of his work in one of the special industries enumerated; if he claimed for a disability that was traumatic in origin, he had to prove that it arose from an industrial accident.

A scale of compensation rates was then drawn up, based on whether the incapacity was partial or permanent, or whether the accident resulted in death. The element of inexcusable fault was inserted whereby the Court reduced the compensation if the accident was caused by the inexcusable fault of the workman, or increased it if it was due to the inexcusable fault of the employer. At the trial, the evidence of such inexcusable fault would, of course, be brought in by the party invoking it against the party whose responsibility would thereupon be affected.

So that the amount of money to be awarded to the workman injured might be conveniently fixed, his disability was interpreted in terms of the extent to which his wages, *i.e.*, earning power, had been reduced. If this injury resulted in death, a fixed amount was to be paid to the dependents.

Medical experts prepared carefully compiled tables, which for indemnity purposes indicated

the fractional degree of reduction in wages or earning power which was involved in the different kinds of accidents, *e.g.*, so much for the loss of an eye, a hand, or a foot, all in terms of the workman's yearly wages.

Medical examination of the workman by a duly qualified practitioner was obligatory if and when so required by the employer, and the workman who refused or obstructed such examination forfeited his right to compensation until he submitted.

So much for the purpose and scope of the Act, as applied in our Superior Courts until 1928. The quarrel that then arose was not directed against the principle of compensation to the injured workman, but only against the procedure involved in the exercise of the workman's recourse. The new Workmen's Compensation Act which came into force March 22nd, 1928 (Chap. 79—18 George V.) took away from the judges of the Superior Court the adjudication over compensation actions resulting from industrial accidents, and transferred this power to a newly created commission, the members of which were appointed by the Lieutenant-Governor-in-Council.

Then came the attack upon the constitutionality of such a commission so appointed. The issue was raised directly in a recent compensation case before our Courts, and Mr. Justice De Lorimier, in a penetrating judgment, ruled that the Provincial Legislature exceeded its authority in the appointment of the Workmen's Compensation Commission, and in enacting that compensation for industrial accidents was to be applied for to that commission. The Provincial Legislature had no authority, he said, to give to the Workmen's Compensation Commission "the distinctive attributes which characterize the functions of judges of the Superior Court, and it is precisely some of these functions which the provincial authority wishes to have fulfilled by persons whom they qualify by the name of commissioners, when, in reality, they are judges fulfilling the duties of judges of the Superior Court, who should be named by the Governor-General."

The point raised in the judgment is clear. The province has the right to make laws and to enact how they are to be applied, but the province has no right to name commissioners to usurp the functions of judges. The right to name those who are to judge cases belongs exclusively to the Governor-General of the Dominion, acting on the advice of his Cabinet.

In order not to leave the judges out of the picture in the working of this new act, it was provided that an award of the commission was to be homologated or "rubber-stamped" by a judge of the Superior Court and thereby become an executory judgment. This comes in for special comment in the judgment, as being an interference with the conscience and independence of the judges and hence utterly obnoxious to the free administration of justice in this province.

So the matter stands to-day. Amid the repercussions of this recent judicial pronouncement one fact stands out. This judgment is too far reaching in its implications to stand unappealed. Already judges outside this province have commented from the bench in terms of the question raised and asked in this judgment, and the whole issue of judgments by commissions bids fair to become a highly contentious legal puzzle which our highest tribunals will be called upon to solve.—Adolph Gardner, K.C., Montreal, in *l'Action Medicale*, 1932, 8: 334.

Abstracts from Current Literature

MEDICINE

Some Clinical Features of Coronary Artery Disease. Levy, R. L., *Am. Heart J.*, 1932, 7: 431.

The data for this article are gleaned from the autopsy records from the Presbyterian Hospital over a ten-year period, namely 1920 to 1929 inclusive. During this time 140 cases, or 10.7 per cent of all autopsies, showed lesions in the coronary vessels. The main etiological factor was arteriosclerosis. Embolism was exceedingly rare, being encountered in only 3 cases out of 3,093 autopsies over twenty-four years. The assembled data show that coronary artery disease, contrary to the current impression, is not on the increase. However, the clinical diagnosis is made more than four times as frequently as it was ten years ago, due as the author believes to the fact that we are more "heart-minded" or "coronary conscious". He divides cases of coronary sclerosis into four groups:— (1) those with cardiac insufficiency; (2) those with cardiac pain; (3) those with digestive disturbances; (4) the latent type, *i.e.*, those without symptoms and sometimes without signs. The electrocardiograph as an aid in diagnosis and in following the progress of the cardiac lesion is stressed.

W. H. HATFIELD

The Effect of Arterio-venous Aneurisms upon the Heart. Reid, M. R., *Ann. Surg.*, 1932, 95: 578.

A fistula between large vessels of the neck or leg may cause marked cardiac hypertrophy and dilation, and in some cases cardiac decompensation and death. The shunting of a large quantity of arterial blood into a vein increases tremendously the amount of work of the heart. The increase is directly proportional to the calibre of the involved vessels and to the size of the fistulous opening. The arterial disturbance results in a lowering of the blood pressure, especially the diastolic, an increased heart rate, water-hammer pulse, and capillary pulsation. A normal pulse pressure is supposed to be

essential to the integrity of the arterial wall. An exceedingly low pulse pressure exists just proximal to an arterio-venous aneurysm. This may account for the degeneration of the proximal artery. The effects vary from slight cardiac hypertrophy to extensive cardiac decompensation. Cases have been reported of complete relief in bed-ridden patients with anasarca following excision of an arterio-venous aneurysm. The majority of arterio-venous aneurysms will sooner or later result in premature death. The author reports a typical case of 17 years' standing.

STUART GORDON

Forced Drainage in the Treatment of Poliomyelitis. Retan, G. M. and Kubie, L. S., *Bull. Neurol. Inst. of N.Y.*, 1931, 1: 419.

The authors point out that the serum treatment of poliomyelitis has not proved strikingly effective and that therefore any accessory methods of treatment are extremely valuable. The method described is known as forced drainage. It consists in prolonged drainage of cerebrospinal fluid, while at the same time stimulating its production by lowering the osmotic pressure of the blood by the administration of large quantities of water by mouth, coupled with the intravenous injection of hypotonic saline.

The experimental basis of the treatment rests on the work of Kubie and Shultz, who were able to show that if the pressure of the cerebrospinal fluid be reduced to atmospheric pressure the production of new cerebrospinal fluid is much accelerated by the administration of water by the mouth, together with intravenous hypotonic saline, and further that this new cerebrospinal fluid was derived not only from the choroid plexus but by transudation through the capillary network of the brain and the spinal cord, which (if drainage is continued) travels along the perivascular spaces to the subarachnoid space, carrying with it inflammatory products, notably lymphocytes from the deep portions of the nervous system; all this without causing hydration of the nervous system or materially increasing intracranial pressure.

The case described is that of a girl of 9, first seen with a temperature of 102°, a pulse of 140, and all the signs of meningeal irritation and a marked tremor of both hands. Lumbar puncture yielded fluid under increased pressure, with 739 cells, of which 90 per cent were polymorphonuclears. The needle was left in place 27 hours and 45 minutes, with the patient on a Bradford frame, a window being cut for the needle. At first fluid drained freely, 45 c.c. in the first half hour, but as owing to nausea the patient was unable to continue taking fluids by mouth drainage almost ceased until the administration of 1000 c.c. of 0.45 per cent hypotonic saline intravenously. After this drainage, the marked tremor of the hands had completely disappeared and after a night's rest there were

no further complaints of pain, though the head was kept retracted for some days. Repeated neurological examination by several different observers proved consistently negative and the child made a complete recovery thirteen days after the onset.

G. N. PATERSON-SMYTH

Episcleritis Due to Allergy. Balyeat, R. M. and Rinkel, H. J., *J. Am. M. Ass.*, 1932, 98: 2054.

The authors report a case of periodic transient episcleritis which they think was caused by sensitivity to certain foods. This man, a physician, aged 37, had been seen by several ophthalmologists who agreed as to the diagnosis, and various internists whom he had consulted could find no focal infection to suggest a cause for this eye lesion.

The diagnosis of an allergic etiology was based on the following points. (1) The patient was subject to urticaria and to hay-fever and was sensitive to various pollens as well as foods. (2) He had suffered for ten or twelve years from recurrences of episcleritis every five or six months, but on avoidance of the suspected foods he had remained free for a year. (3) An attack of episcleritis occurred when he deliberately ate certain of the suspected foods.

This appears to be the first case of the sort diagnosed and successfully treated on an allergic basis. The writers point out that "the fact that a patient with episcleritis has not suffered or does not suffer from some well recognized allergic syndrome. . . by no means rules out the possibility of allergy as an etiologic factor."

T. G. HEATON

SURGERY

Incidence of Nodules in the Thyroid. Rice, C. O., *Arch. Surg.*, 1932, 24: 505.

It is a well recognized fact that nodules may be present in an otherwise normal thyroid gland. Their significance has never been determined. They probably represent an attempt to establish a physiologically normal gland, hence may be considered physiologically normal. Rice makes a comparative study of symptomless thyroid glands removed at autopsy and of hyperfunctioning goitres operatively removed. These latter were from patients with diffuse toxic and adenomatous goitres. The post-mortem series was of supposedly normal thyroid glands removed from unselected patients dying of diseases other than those of the thyroid gland. He concludes that nodules are found post-mortem as often in the thyroid gland considered to have been physiologically normal as in the hyperfunctioning goitre removed by operation. The greater prevalence of colloid nodules in the former may be due to the fact that differences in the degree of reversion, growth, differentia-

tion and encapsulation have not been forced on the normal gland as strongly as they have in the toxic goitre. Nodules were found in 56.95 per cent of the physiologically normal thyroid glands and in 57.14 per cent of the toxic goitres. Forty-two and eighty-five-hundredths per cent of the toxic goitres have no nodules and are manifested as exophthalmic goitre. Thirty-five per cent of the thyroid glands that become hyper-functioning can be classified as adenomatous goitre with hyperthyroidism. The remaining 22 per cent of glands contain nodules, but manifest their hyperthyroidism as exophthalmic goitre. Diffuse toxic goitre occurs proportionately as often in glands with nodules as in glands without nodules. On these grounds the presence of nodules in the thyroid gland is physiologically normal, and the incidence is not appreciably altered by the development of hyperthyroidism.

G. E. LEARMONTH

Squamous-Cell Carcinoma of the Kidney.

Rabinovitch, J., *Arch. Surg.*, 1932, 24: 581.

The author has been unable to find in the literature a case similar to the one he reports of a malignant condition in which the renal artery was completely occluded by a cancerous thrombus. There was also complete infarction of the kidney, which is rarely met with. The case which he records occurred in a woman, aged 64, who on entrance to hospital complained of abdominal pains of five months' duration, which at first were dull but recently more intense and continuous and of a stabbing character. There were no urinary or other physical disturbances. On physical examination, tenderness was complained of on pressure in the left upper abdomen in the region of the left kidney, though the kidney could not be palpated. Ureteral catheterization showed that the left kidney was not functioning. Roentgenograms, following injection of sodium iodide by the ureteral catheters, disclosed a block above the left catheter and there was no pelvic shadow. A tentative diagnosis of congenital absence of the left kidney was made. Tuberculosis and ureteral stricture were considered. At operation the left kidney was found to be about the size of a lemon and was removed. The renal artery was partially occluded near the hilus of the kidney. The patient had an uneventful convalescence. On pathological examination the external surface showed a number of punctate hæmorrhages. On hemisection the renal parenchyma was found to be almost entirely obliterated and it appeared as though this was due to infarction.

Microscopical examination showed typical squamous cell-carcinoma. The main branch of the renal artery was occluded by cancerous tissue and the entire wall was penetrated by this growth. There was extensive necrosis of the parenchyma due to the thrombotic occlusion

of the renal artery. There has been no evidence of metastasis in this case. Rabinovitch discusses various etiological factors in the production of metaplastic and heteroplastic epithelial changes.

G. E. LEARMONTH

Fallen Idols. The Case of Appendicitis. Berry, Sir J., *The Lancet*, 1932, 1: 1027.

The author presents a comparison of the treatment of acute appendicitis forty years ago and to-day. His opinion seems to be that, while not disagreeing with early operation, he feels that the results would be equally as good if not better without early operation, and that in the stage of distension or abscess-formation early operation is totally undesirable. He feels that it is injudicious treatment, whether medical or surgical, that does so much harm in acute appendicitis. In either case the three principal causes of death are: (1) feeding the patient when he should have been starved; (2) giving purgatives and enemas; (3) attempting by means of drugs or otherwise to relieve the abdominal distension. He deprecates the use of free incision in an appendiceal abscess.

Sir James quotes from two letters that he wrote to *The Lancet*, thirty-two years ago, citing 2 deaths in 41 cases where the incision was limited by adhesions, and 32 deaths amongst 39 patients treated by free incision into the peritoneal cavity. He cites the results of two cases, that of King Edward VII treated in a conservative manner, and that of President Ebert who was subjected to an early operation.

He does not think that appendicitis is more common than it used to be or that the type of infection has become more virulent.

He realizes that he may be blamed for having again brought forward these views about the treatment of appendicitis. He desires to introduce "a little more sanity into the present day treatment of acute appendicitis, a little more discrimination and judgment in the choice of operation, and when, and how it should be performed when it is really necessary, a little less reliance on the hard-and-fast rule, adopted by so many, of operating at any and all stages—a rule so easy to follow, but often so disastrous to the patient."

W. L. GRAHAM

Recent Advances in the Treatment of Fractures.

Jones, R. W., *Brit. M. J.*, 1932, 1: 1073.

The three aspects of the treatment of fractures are (1) reduction of displacement; (2) complete immobilization of the fragments; (3) functional activity. In order that the latter point be satisfied no more of the limb should be splinted than is absolutely necessary.

Modern treatment anticipates the complications of muscle wasting, joint stiffness, and mental fear, and instead of treatment being

prescribed after these conditions have developed, steps are taken to prevent them from appearing.

Fractures of the carpal scaphoid require perfect immobilization for 2 to 4 months. Necessary functional activity can be realized if Bohler's dorsal plaster cast is used. Ninety-seven recent fractures treated in this manner resulted in 97 unions; 22 old fractures so treated resulted in 1 failure. Radial deviation is advised in ununited fractures.

Average "crush" fractures of the spine require immobilization in plaster jackets for 4 months; severely comminuted ones, 6 months. In uncomplicated cases ambulation is commenced within a few days.

The Whitman plaster remains the method of choice for fractures of the base of the femur. Trans-cervical and sub-capital fractures are best treated with the Smith-Petersen flanged stainless steel nail. With this method knee movements can be kept up, and normal muscle tone maintained.

Fractures of both bones of the leg with over-riding are treated with traction on a pin driven through the os calcis. Unpadded plaster is then applied from toes to mid-thigh. When a walking plaster is applied subsequently sorbo rubber is incorporated at the heel. Walking in a below-knee plaster can be commenced in 8 weeks.

STUART GORDON

OBSTETRICS AND GYNÆCOLOGY

Blood Chemistry Study in Normal Pregnancy and Eclamptogenic Toxæmia. Kaplan, S., *Am. J. Obst. & Gyn.*, 1932, 23: 673.

Twenty cases of pre-eclamptic toxæmia, 5 cases of eclampsia, 5 cases of nephritic toxæmia, and 10 cases of normal pregnancy were studied and the results were compared with a similar analysis of 10 cases of normal non-pregnant women used as controls. It was hoped that the results of this investigation might prove of diagnostic import in the complications of pregnancy, but as clinical symptoms appear before any changes in blood chemistry the latter offers little information towards diagnosis. In the prognosis of toxæmias of pregnancy changes in blood chemistry are of importance, since there is an increase in the uric acid content of the blood in pre-eclamptic toxæmia, eclampsia and nephritic toxæmia, the increase in each condition being proportional to the severity of the disease.

The investigation showed: (1) There is an increase in the non-protein nitrogen from 24 in the third month to 35.27 in the ninth month; (2) uric acid shows a slight increase during the ninth month of pregnancy; (3) the sugar content of the blood is diminished from 84.2 in

the third month to 70.47 in the ninth month; (4) in pre-eclamptic toxæmia, the non-protein nitrogen, urea and uric acid show a slight increase over that found in normal pregnancy, with a return to normal in six weeks; (5) in eclampsia the non-protein nitrogen, urea-nitrogen and uric acid show a greater increase than that found in pre-eclamptic toxæmia with a similar return to normal; (6) in nephritic toxæmia, the nitrogenous constituents show a more marked increase and do not return to normal even at the end of six weeks after delivery.

ROSS MITCHELL

Coagulability of the Blood in Pregnancy.

Bland, P. B. and Goldstein, L., *Am. J. Obst. & Gyn.*, 1932, 22: 815.

Tests for the determination of the coagulation time of the blood were performed on 100 non-pregnant women and on 400 gravid patients in the various periods of pregnancy; additional tests were performed on 100 patients during the lying-in period. It was found that only 36 per cent of 100 normal non-gravid women gave a clotting time ranging between one and five-tenths and two and five-tenths minutes, whereas in 349, or 87.2 per cent, of the 400 women examined in pregnancy the coagulation time was completed before two and five-tenths minutes. On the basis of these results one may safely conclude that the coagulability of the blood (as shown by the test employed) is relatively increased in pregnancy. Because of the small differences in the clotting time of the pregnant and non-pregnant individuals, the authors feel that this test cannot be relied upon to disclose the efficiency of the mechanism of coagulation. The results of the test in the puerperal period show that there is a rather sharp tendency for the readings to return to the values found in the non-gravid state.

ROSS MITCHELL

PÆDIATRICS

The Diagnosis of Congenital Syphilis in the New-Born. Dunham, E. C., *Am. J. Dis. Child.*, 1932, 43: 317.

It is well known that the existence of a positive Wassermann reaction in the mother does not necessarily mean that her new-born child will develop syphilis. It is, however, less generally known that perfectly healthy new-born children of syphilitic mothers may show in the first two weeks of life a transitory positive Wassermann reaction, due not to actual infection of the infant but to the presence of antibodies which have passed from the mother's blood through the placenta into the infant's circulation. In order to avoid unnecessary treatment and false conclusions with regard to

the efficacy of treatment, it is important to differentiate between cases of congenital syphilis and those with a pseudo-positive Wassermann reaction. A Wassermann reaction becoming weaker, and finally negative, in successive tests in the neonatal period is the serological criterion by which the pseudo-reactors are distinguished.

The decision as to when treatment should be given and when withheld is sometimes a difficult one. In the author's clinic at New Haven the policy with regard to new-born infants free from symptoms and signs of syphilis, though born of luetic mothers, is as follows. If the mother has had some antisyphilitic treatment during pregnancy, or has latent syphilis, or has had treatment in a previous pregnancy, or has borne a healthy child since the date of her infection, the infant is not treated. The serological test is repeated one or more times until evidence is obtained with regard to change in the strength of the reaction and a correct diagnosis established. If any signs of active infection present themselves, clinically or roentgenologically, in the infant, or if the mother has a recent or active syphilitic infection, the child is of course treated, regardless of the Wassermann reaction. The first complement-fixation test is made a day or two after birth; if positive, it is repeated in a few days and again on discharge from the maternity ward (ten or fourteen days). If the reaction is weaker at each successive test, treatment is withheld. If the strength of the reaction remains unchanged throughout the child is regarded as luetic and treatment begun.

A group of 14 infants with no clinical or roentgenological signs of syphilis, but with positive Wassermann reactions and luetic mothers, is reported. In 3 cases the first Wassermann test showed complete fixation, in 11 a weaker reaction. A negative or weak reaction was usually obtained by the tenth or fourteenth day. None received treatment. None developed any signs of syphilis, although kept under observation for a period varying from two months to four years.

The author concludes that correct evaluation of the results of repeated Wassermann tests in the neonatal period, in the case of infants without clinical signs of lues but born of luetic mothers, will prevent the unnecessary treatment of non-syphilitic infants.

A. K. GEDDES

Whooping Cough: The Blood Picture, with Special Reference to Early Observations.

Sauer, L. W. and Hambrecht, L., *Am. J. Dis. Child.*, 1931, 41: 1,327.

These authors studied the blood picture in pertussis in order to determine whether or not examination of the blood is of diagnostic importance in the early or catarrhal stage of the disease, when clinical diagnosis is often im-

possible. Serial blood counts were made in 70 children whose average age was four years. The characteristic leucocytosis and lymphocytosis were always found when the paroxysmal stage was at its height. The greatest variations occurred in the catarrhal stage and in the stage of decline of the pertussis cycle. In the former, the majority did not show a high white count or a characteristic differential count, but in the earliest cases of this catarrhal group leucopenia was a very common finding. In the stage of decline the blood picture was variable, but at the eighth or ninth week (on the average) when the cough had almost subsided, there occurred a leucopenia which preceded the return to the normal blood picture. The conclusions are reached that the blood picture is seldom an aid in early diagnosis; that initial leucopenia and terminal leucopenia are probably integral parts of the blood picture in pertussis; that leucocytosis and lymphocytosis are usually present when the paroxysmal stage is well established.

A. K. GEDDES

UROLOGY

The Management of Urinary Calculi. Jacobs, A., *Brit. M. J.*, 1932, 1: 513.

The characteristic symptoms of urinary stone are (1) pain, (2) hæmaturia, (3) frequency, (4) nausea and vomiting, and later (5) pyuria. During an attack the more pronounced the bladder symptoms, the more probable it is that the stone is lying in the lower segment of the ureter. When the stone projects from the ureteral orifice pain is felt in the tip of the penis at the end of urination. Pain becomes fixed when the stone is impacted, usually noted along the outer border of the rectus. Stone may cause pain during or after coitus. Occasionally pain is felt on the opposite side to the stone.

X-ray examination, cystoscopy, ureteral catheterization and pyelography should show the number, size, and position of calculi, and the amount of damage to the host. Excretion urography is also of value.

Stones in the kidney should be removed. Very small calculi may be treated expectantly, i.e., large amount of fluids, urinary antiseptics, and periodic pelvic lavage being employed. Stones may be removed through the kidney or through the pelvis. If both kidneys are affected the better functioning one should be operated upon first.

Ureteral calculi are at first treated conservatively. Dilatation of the ureter, with injection of liquid paraffin, is tried at weekly intervals for four or five weeks. If no result is obtained surgical removal is necessary. The stone is removed through a small vertical incision in the ureter. This opening is closed with two or three fine catgut sutures which

avoid the mucous coat. Drainage is left in place for four days.

Frequency is the most common symptom of bladder stone. If not expelled the stone will increase in size. A bladder sound often aids in diagnosis, but the surest method is the use of the cystoscope. Litholapaxy is the treatment of choice, except where (1) there is co-existent bladder disease, (2) the stone is in a diverticulum, (3) the stone is very large, (4) sepsis is severe, or (5) there is a stricture of the urethra.

STUART D. GORDON

Intravenous Urography in Infants and in Children. Lanman, T. H. and Mahoney, P. J., *Am. J. Dis. Child.*, 1931, 3: 611.

Case reports are presented of 21 children in whom an attempt was made to study the genito-urinary tract by means of intravenous urography; the efficiency of the procedure as applied to children is evaluated on the basis of these cases. The youngest patient was two months, the oldest eleven years of age. The 21 cases cited represent a fair cross-section of the pathological conditions of the urinary tract as encountered in infants and children.

The medium employed in most cases was "Iopax," in a few instances, "Skiodan." One-twentieth to one-tenth of a second roentgen exposures were used, with the patient in the Trendelenburg position. The best concentration of the drug in the renal pelves and ureters was seen in films taken from 45 to 60 minutes after injection. The dose employed varied from one-quarter the adult dosage to full adult dosage. One patient, aged 6½ months, died 18 hours after administration of the drug. An appreciable reaction—fever, flushing, and vomiting of a few hours' duration—occurred in a 7 year old boy. The severity of the reactions seemed not to be dependent on the dosage of the drug or on the amount of kidney damage present.

It is known that where considerable infection of the urinary tract and concomitant renal damage is present intravenous urography may give unsatisfactory results. The majority of cases in infants and children requiring urological investigation are those in which there is considerable pyuria and associated renal damage. In such cases—and particularly in the pyurias of infancy—intravenous urography gives either no visualization of the kidneys and ureters or so little that no reliable interpretation can be made. In cases of congenital anomalies of the urinary tract, the procedure is in some instances diagnostic, in others ineffective. In the important group of cases with dilated ureter and pyuria, intravenous urography gives little or no visualization, whereas the simple and harmless procedure of cysto-

graphy (by injection of sodium iodide into the bladder) usually gives excellent visualization of the entire tract.

The authors urge the employment of all simple diagnostic means, notably cystography, before resorting to pyelography. The value of intravenous urography in childhood is extremely limited, except in cases not associated with marked pyuria. The limitations are so definite as to contraindicate its use at present except in carefully selected cases and in the hands of those familiar with urography in childhood.

A. K. GEDDES

OPHTHALMOLOGY

The Results of Obliterating Cautery-Puncture in Detached Retina. Gonin, J., *Ann. D'Ocul.*, 1931, 168: 689.

The present series of 300 observations has confirmed entirely what the author has said for many years, that is, that a tear of the retina is the determining cause of the detachment called "spontaneous," and that obliteration of this opening suffices in recent cases to procure a complete and durable cure. Obliteration may be obtained by reapplication on the tear of the raised retina, either indirectly by the formation of adhesions between the ends of the retinal opening and choroid, or by a cicatrix which obstructs the progress of the detachment, in the presence of a large tear, especially of a peripheral detachment of the retina.

In more than 50 of the total number of cases (65 out of a total of 300 in his series), one thermo-puncture directly on the tear suffices to cause obliteration, and permits cure in about fifteen days. In cases operated upon in the first three weeks, the proportion of successes is found to be doubled. In 53 of the 300 cases, they were obliged to repeat the thermo-puncture because the first application was incomplete or was followed by a relapse. In detachments of less than one year, cures may be obtained in the neighbourhood of 40 per cent, while cases dating over three months show in his experience about 48 per cent, and this can be brought to 55 per cent if the operative intervention is made at least three weeks after the appearance of the detachment.

All relapses indicate an insufficient obliteration of the initial tear or the presence of another not reached by the cautery. A relapse due to the production of a new tear, independent of that which caused the first detachment, may be met with after a few months or years, and, even though it is a troublesome symptom, the possibility of renewing treatment with subsequent cure is not excluded. Of all procedures proposed up to the present, the thermo-cautery directly to the retinal tear is the one which gives the most certain results.

Operators who do not give sufficient attention to retinal tears, expose themselves to numerous failures.

S. HANFORD MCKEE

The Treatment of Spring Catarrh—Light as the Determining Cause of the Disease. Colombo, *Ann. D'Ocul.*, 1931, 168: 370.

Spring catarrh in its initial form is completely and rapidly cured by rigorous protection from light and by the desensibilization of light by suitable drops. The old forms show a rapid lessening of their manifestations of the recurrent attacks (itchiness, hyperæmia, discharge) and proceed slowly to their clinical cure by the same measures. This treatment is practical and easy. The general treatment is simple—sun baths, glandular therapy, iodine and calcium. The results obtained show that in predisposed subjects (vagotoniques) light is the direct local cause of the disease.

S. HANFORD MCKEE

W. R. Hess Method. Graphic Representation of the Oculo-motor Affections: Its Advantages. Masselin, M., *Ann. D'Ocul.*, 1931, 168: 352.

The graphic representation of oculo-motor affections, described by Hess in 1908 (*Archiv. f. Augenheil.*, 62), is described in detail with illustrative cases and charts. It is a method in which the examination is graphically registered on a specially prepared chart. It is simple and is done in broad daylight with a minimum of discomfort to the patient. It is also easily understood by the patient who is able to note varying features of the diplopia, such as the degree and inclination. By giving a quantitative registration of the degree of paralysis, changes occurring during the development of the disease may be easily compared, as it is possible to represent the effects of the deviation from a paralysis by means of the charts. This method, however, does not show the rotating action of certain muscles on the vertical meridian, which would be shown by other methods such as those of Hoffmann and Bielchawsky, so that it is not meant to supplant other useful methods, but rather to supplement these with the assistance of useful graphic charts.

S. HANFORD MCKEE

NEUROLOGY AND PSYCHOLOGY

The Criminal Feeble-Minded. Richmond, F. C., *Arch. Neur. & Psychiat.*, 1931, 26: 853.

Richmond, who is the director of the Wisconsin Psychiatric Field Service, states that the public is unaware of the extent to which feeble-mindedness plays a rôle in producing criminals. He defines the class as follows: "The criminal feeble-minded are those persons under or within the jurisdiction of penal, reformatory or correctional agencies or institutions, showing

an intelligence quotient not above seventy-five, whose low mental level is due to arrested development." The cause and incidence of feeble-mindedness are discussed, and he concludes that the proportion of feeble-minded among the criminal class increases steadily as the age of the criminal rises. He considers broken homes only as out-ranking feeble-mindedness in the production of the criminal class. He states that in the Army in the World War, 42 per cent of the men requiring discipline were feeble-minded, and that no class causes so much mischief in an army as this group. "There are sufficient grounds for excluding all mental defectives from the military forces, except when the last available man power must be utilized". (Quotation from the "Medical Department of the United States Army in the World War", vol. 10.) What an indictment against war, that cannot afford to use the mentally deficient until the last necessity arises, but leaves them to be the fathers of the next generation, while the mentally capable are deemed worthy sacrifice for slaughter! He advocates that those who are incapable of being returned to society be cared for in the proper institutions, while those whose return to the community is practicable at some time should, after sterilization, be paroled indefinitely under the supervision of the law. In support of his final recommendation on sterilization, Richmond states that mental deficiency, when not acquired through trauma or disease, is transmissible from parent to child.

MADGE THURLOW MACKLIN

Observations on Abnormalities of Pupil and Iris in Tabes, with a consideration of their possible bearing on pathogenesis of Argyll-Robertson pupil. McGrath, W. M., *J. Mental Sci.*, 1932, 78: 321.

The author claims that to define the Argyll-Robertson pupil as merely a loss of the light reaction with preservation of accommodation is inadequate and misleading, for in addition there are invariable changes in size and shape of pupils, and what is rarely pointed out, changes in the iris of an atrophic type. To him, then, the Argyll-Robertson pupil is a complex phenomenon, consisting of these various elements: (1) Loss of direct and consensual light reaction with preservation, complete or partial, of accommodation reaction. (2) Abnormalities in (a) size and (b) form of pupil. (3) Trophic changes in iris. If all these be present, then the causal factor is invariably neuro-syphilis.

From this study, he suggests that the lesion causing Argyll-Robertson pupil is not, as is generally held, in the grey matter about the aqueduct, for such a central lesion cannot account for the trophic changes in the iris, or

the irregularity of pupils mainly due to segmental involvement of pupil—these being strongly suggestive of a peripheral lesion, possibly located in the ciliary ganglion.

He points out in conclusion that the so-called Argyll-Robertson pupil found in certain non-luetic midbrain lesions, may be clinically distinguished from the true syphilitic Argyll-Robertson pupil, with its associated changes in iris, and variations in size and shape of pupil.

G. PATERSON-SMYTH

The Basophil Adenomas of the Pituitary Body and Their Clinical Manifestations (Pituitary Basophilism). Cushing, H., *Bull. Johns Hopkins Hosp.*, 1932, 50: 137.

Twelve cases of a polyglandular syndrome hitherto supposed to be of cortico-adrenal origin are discussed. Six out of 8 of these have been found at autopsy to be associated with a pituitary adenoma which in the 3 most carefully studied cases has been definitely shown to be composed of basophilic elements.

All these cases showed the following characteristic features: (1) a rapidly acquired, peculiarly disposed and usually painful adiposity; (2) a tendency to become round-shouldered, associated with lumbo-spinal pains; (3) a sexual dystrophy shown by early amenorrhœa in the females and ultimate functional impotence in the males; (4) a tendency to hypertrichosis of face and trunk in all the females as well as preadolescent males, and possibly the reverse in the adult males; (5) a dusky or plethoric appearance of the skin, with purplish lineæ atrophicæ; (6) variable backaches, abdominal pains, fatigability and ultimate extreme weakness.

The average duration of life of the fatal cases was five years, and all the patients succumbed to progressive enfeeblement associated in most cases with terminal infections. One of the two patients reported from the author's clinic who appeared to be rapidly approaching his end was given four x-ray treatments and made a remarkable recovery.

While the evidence in favour of the relation of this syndrome only to basophilic adenomas of the pituitary body is still somewhat equivocal, this article will provide pathologists with greater stimulus to carefully search the anterior pituitary for such lesions.

FRANK A. TURNBULL

PATHOLOGY AND EXPERIMENTAL MEDICINE

The Immediate Effects of Various Pyelographic Media upon the Mucosa. Mark, E. G. and Johnston, E. T., *J. Urol.*, 1932, 27: 595.

A series of experiments were carried out on 40 dogs to demonstrate the effect on the bladder

mucosa of pyelographic media. The media used were uroselectan in 40 and 20 per cent solution; iopax in 30 and 15 per cent solution; skioldan in 20 per cent solution; sodium bromide in 25 per cent solution, and sodium iodide in 12.5 per cent solution. Normal saline was used as a control. After emptying the bladders, with the catheter *in situ*, from 50 to 90 c.c. of the media were slowly injected by the syringe method. Twenty-four hours later the dogs were sacrificed and the bladders removed for laboratory study. A large percentage of the bromide bladders showed marked distension, it being quite evident that in most instances the dogs had not voided after the injection. This loss of the power of contractility in these cases has been observed by other workers.

It becomes quite evident from these experiments that, while there can be no question but that over-distension is productive of damage and pain, even with the use of mild solutions, the real factor in causing irritation and mucosal damage lies in the character of the drug itself and its immediate effects upon the mucosa.

Those bladders where 25 per cent sodium bromide solution was used showed marked injury to the mucosa, ranging from focal hæmorrhage and ulceration to diffuse hæmorrhagic inflammatory exudate, with focal necrosis. Fragility tests with this medium shows it to have a marked hæmolytic action. It is felt that this is an entirely unsuitable urographic medium.

Where sodium iodide, in 12.5 per cent solution, was used the bladders consistently showed congestion of the mucosal vessels and varying degrees of œdema, but no true hæmorrhagic or ulcerative lesions. Fragility tests showed hæmolytic action after twenty-four hours.

Where skioldan, uroselectan, and iopax were used there was no more evidence of injury to the bladder mucosa than noted with the control bladders where physiological salt solution was used. Occasionally a few petechiæ were observed, but nothing more. Iopax causes about the same degree of hæmolysis as sodium iodide while skioldan causes none whatever.

While it is admitted that over-distention is productive of damage and pain, the real factor in causing irritation and damage lies in the character of the drug itself. With either iopax or skioldan there is no damage to the mucosa, and hence bilateral pyelograms may be made with impunity.

N. E. BERRY

The Rôle of the Pituitary Gland in Parturition.

Allan, H. and Wiles, P., *J. Physiol.*, 1932, 75: 23.

Hypophysectomy was performed on a series of pregnant cats, either by the buccal route or by a new retro-pharyngeal route. Normal delivery of the litters took place at various times, up to eleven days, after the operation, hence

the pituitary is not essential either for the maintenance of pregnancy or for the process of parturition; this confirms the recent work of P. E. Smith on the rat. On the other hand, in cases where the litters were born alive (as was usually the case), the mothers made no attempt to care for or suckle their young. This recalls the similar failure of the suckling instinct after sympathectomy (Cannon) or on diets free from manganese (McCollum).

D. L. THOMSON

The Effect of Lecithine on Fat Deposition in the Liver. Best, C. H., Hershey, J. M. and Huntsman, M. E., *J. Physiol.*, 1932, 75: 56.

It has long been known that depancreatized dogs receiving insulin tend to decline and die with symptoms of impaired liver function (which include decrease of the hyperglycemia and glycosuria and other diabetic manifestations), the liver being found to be heavily loaded with fat. To prevent this, it was usual to supply raw pancreas by mouth; but it has now been shown that the place of pancreas may be taken by raw or crude lecithine, from egg-yolk or other suitable sources. Intact animals (rats) on a diet very rich in saturated fats also show livers overloaded with fatty acids, yet this can be prevented by the incorporation of more fatty acid, in the form of lecithine, in the diet. The mode of action of the lecithine is not known; it does not increase fat excretion, but presumably increases fat-utilization in some manner. Its efficacy does not depend upon any adherent vitamins, but appears rather to reside in the choline fraction of the lecithine molecule.

D. L. THOMSON

RADIOLOGY

The Therapeutic Application of the Roentgen Ray in Angina Pectoris. Samuel, E. C. and Bowie, E. R., *Am. J. Roentgenol.*, 1932, 27: 870.

Surveying the results of x-ray therapy in malignancy, it is stated that perhaps we have been too modest in reporting results, as patients who are being treated for hopeless malignant disease are often loud in praise of the relief from pain which accompanies x-ray therapy, which we know is only palliative so far as their cancer is concerned. The mechanism of the relief from pain is not known, but it merits the widest possible investigation and experiment.

In 1928 the authors treated an undoubted case of angina in a colleague with satisfactory permanent result and freedom from subsequent attacks. The attempt to attain a satisfactorily large group of cases has been delayed on account of the fact that one is offering a comparatively new and untried remedy for a

condition which demands the most certain and efficacious treatment at our command.

We are aware of the paroxysmal character of the disease—the sense of impending death—the pain in the upper chest. All cases in the series conformed to this type and all were of the more severe type. The series includes 19 cases—15 men and 4 women. All cases had the usual official treatment and were referred to x-ray because they received little relief. The technique at first was that of heavy dosages; since the third case, smaller doses at more frequent intervals have been used. At present the following technique is used: 140 K v. P., 5 M.A., 20 inches distance, 0.25 mm. copper and 1 mm. aluminum, 8 to 10 minutes' time. This is approximately 150 R. Areas exposed are the anterior chest wall, left side, and occasionally the back. The dosage is repeated every two weeks until four series have been completed or until symptoms subside. After this, treatments are given every six or eight weeks.

The success of the treatment has been uniformly good. Of the 19 cases 1 is dead of intercurrent disease; the other 18 are well, and both the patients and their physicians believe that roentgen therapy has been the deciding factor in the control of their symptoms.

A. S. KIRKLAND

Results of Radiation Therapy in 1,022 Private Cases of Carcinoma of the Breast from 1902-28. Pfahler, G. E., *Am. J. Roentgenol.*, 1932, 27: 497.

A large group of interesting charted statistics is commented upon. Mr. Sampson Handley is quoted to the effect that cancer of the breast when it comes to operation is already an intrathoracic disease. It is therefore reasonable to irradiate the chest very thoroughly with special reference to the lymphatic areas. The first course should be very thorough and vigorous. Radium is used for intensive local effect and roentgen radiation for its wider and deeper distribution. Over the period covered, the results have gradually improved. Cases referred for pre-operative radiation are in the great majority of instances termed inoperable and the recurrent or metastatic cases also form a large group, whereas in surgical statistics, the cases are largely primary cases. Recurrences that appear in a few weeks only occur when an incomplete removal of the local disease has been done. Sufficient work has been done to prove that irradiation is the best treatment for recurrences. Therefore, irradiation should be begun a few days after operation. Operation for recurrence is sometimes advisable, as it allows of microscopic examination, followed by vigorous irradiation. The author is convinced that all cases should be given prophylactic irradiation after operation and also that pre-operative irradiation is of value. In many cases, inoperable conditions

were rendered operable by pre-operative roentgen treatment. In the group of "inoperable primary cases" 30 per cent were alive at the end of five years or more. The most striking showing on the value of irradiation is the recovery of 36 per cent of the 934 cases that had passed the five year period. This represents the absolute recovery value of the average of all cases of cancer of the breast.

There is no standard technique; every case must be treated according to individual indications. Radium was only used on special indication in individual cases and these cases show no greater percentage of recoveries than those in which roentgen rays were used alone. In those cases of cancer of the breast in which the condition has passed the first stage, 24.5 per cent were well at the end of five years following surgery alone. The author's results show 46.6 per cent well at the end of five years when surgery and irradiation are combined—or a gain of 90 per cent as compared with the average of surgery alone.

A. S. KIRKLAND

Obituaries

Dr. George Gordon Campbell, of Montreal, specialist in children's diseases, and an authority on dermatology, died on June 26, 1932. He was in his seventieth year.

Born in Nova Scotia, the son of the late Mr. and Mrs. George Campbell, of Truro, N.S., Doctor Campbell took his Bachelor of Science degree at Dalhousie University. He then came to McGill for his medical course and graduated in 1889.

Doctor Campbell was connected with the teaching staff of McGill University for a generation, and held the following positions: Lecturer in Medicine from 1900 to 1910; Lecturer in Clinical Medicine, 1902 to 1910; Lecturer in Medicine and Clinical Medicine, 1910 to 1912. He was Lecturer on Diseases of Infants and Children from 1906 to 1931; Lecturer in Dermatology from 1906-07 to 1922-23, and Clinical Professor of Dermatology from 1923 to 1928. He was dermatologist at the Montreal General Hospital for many years after he succeeded the late Dr. F. J. Shepherd. He occupied this post until last year, when he retired.

Doctor Campbell's attention was largely confined to diseases of the skin during the later years of his life, and he wrote a book on the subject, which was received by the profession as authoritative. He was a regular contributor to medical magazines on subjects relating to diseases of children and dermatology.

He was a botanist of note and possessed a varied collection of Canadian wild flowers.

Besides his widow, formerly Miss Ada C. Clark, he is survived by three sons, Balfour, George and Gordon; and by two brothers, Arthur, of Ottawa, and Alexander, of Truro, N.S.

John H. Carson, M.D., Superintendent of the Home for Incurables at Marpole, B.C., passed away in that institution on May 17, 1932. The late Dr. Carson was born in Ontario in 1862, and when quite young moved with his parents to Illinois. He was for a time

a school teacher, later studying medicine at the Medical College of Indiana, where he graduated in 1890. For some years he practised in Indianapolis, and in 1902 he returned to Canada, practising at Lauder, Man. In 1909 he moved to Victoria, B.C., later resuming the practice of his profession in Vancouver. He was at one time Police Surgeon of the City of Vancouver, and for the past nine years was in charge of the Provincial Home for Incurables, where his kindness and sympathy fitted him admirably for his duties. He was an active member of the Masonic fraternity.

He is survived by his widow and one daughter, in Vancouver, and by a son, Ingriffe D., formerly on the headquarters staff of the Canadian Medical Corps in England, and at present in Brazil. C. H. BASTIN

Dr. Allan B. Cook, well-known Toronto medical practitioner, died early in July at his residence, after a brief illness.

He was born in Welland County in 1854, of United Empire Loyalist descent on both sides. He graduated from Toronto University in 1875 with the degree of M.B., receiving the same year M.B. and M.D., C.M., from Trinity University, and the degree of M.D. from Victoria University, and securing the scholarship and gold medal. Immediately after graduation, he settled in Welland, where he practised for nine years. From there he went to Oxford County, where he remained seven years, coming to Toronto in 1892.

In 1900 he married Miss Stella MacNaughton, daughter of the late J. H. MacNaughton, the well-known poet. He was a member of the Anglican Church of the Messiah, the Brotherhood of St. Andrew, and the Masonic Order. His wife survives, also a brother in California.

Dr. J. H. Evans, of Sault Ste. Marie, physician to the Algoma Steel Corporation, met death by drowning on June 27, 1932. Doctor Evans was born in Kingston in 1897, graduated from Queen's University in 1924, and came to the Soo in August of 1925. He was very popular, an enthusiastic supporter of football, and active in all other sport. He married the widow of the late Major C. V. Campbell and leaves two children.

Dr. William McKenzie McLeod, of Sydney, N.S., died on June 12, 1932, after an illness of six months. He was 77 years of age.

The son of the late Rev. Dr. Hugh McLeod, he was born in Sydney and studied at Dalhousie University, Halifax.

Doctor McLeod was prominent in Cape Breton political circles for many years. From 1872 to 1882 he represented Cape Breton County in the House of Commons and sat with Sir John A. Macdonald. He won the seat in a by-election to fill the vacancy created by death of his brother, Dr. Hugh McKay. He was a member of Parliament when the Canadian Pacific Railway bill was passed.

Doctor McLeod was a soldier and always maintained an interest in military work. He was largely responsible for organization of the old Sixth Field Artillery, in which he held the rank of commanding officer. This unit later won distinction in the Great War.

He was the oldest living member of the Cape Breton Medical Society. Several months ago Doctor McLeod, Dr. E. J. Johnstone and Dr. Arthur Kendall celebrated the golden anniversary of their graduation into the medical profession, and all three were presented with canes at a complimentary dinner tendered by the Society.

Doctor McLeod is survived by his widow; one daughter, Mrs. George Stanway, of Calgary; two brothers Dr. J. K. McLeod, Health Officer of Sydney, and Dr. Thomas McLeod, Bay Roberts, Newfoundland.

News Items

Great Britain

The Osler Club.—At a meeting held in London on June 24th Dr. Wilfred Harris gave an address on "Hughlings Jackson," skilfully blending the narrative of his career with a delicate and reverent appreciation of Jackson the Man. That great neurologist, Doctor Harris said, was one of the most modest people who ever lived. He went out of his way not to hurt other men's feelings. There was a curious note of sadness in his composition, much in his later years deepened into gloom, yet he had a sense of humour. One of his most interesting papers is his address on the psychology of joking which he gave before the Medical Society of London in 1887. A keen and accurate observer of details, he was inclined to build theories on their foundation, sometimes wrongly. His literary style was laboured, and he may be said to have written "with a stammer". It is recorded that he rewrote at least one paper thirteen times. Even the finished versions of his articles were bespattered with footnotes. In many respects his vision was telescopic: it extended far indeed, but it was narrow. As a man he had few outside interests; he took no exercise, and read trifling literature for relaxation. Jackson was a pioneer in the use of the ophthalmoscope in the diagnosis of nervous diseases. The lecturer dealt at some length with Jackson's association with the National Hospital, Queen Square, with the foundations of the Neurological Society and of the Journal, *Brain*, and his researches on what is now universally known as "Jacksonian epilepsy." It is interesting to note that Jackson was always careful to stress the priority in this discovery of Bravais (1824). During the address a number of photographs, autograph letters, medals, and reprints were handed round and greatly appreciated.

The discussion was opened by Mr. Lionel Colledge, F.R.C.S., and continued by Drs. A. P. Cawadiaz, O.B.E., and J. D. Rolleston, F.R.C.P., F.S.A., Prof. Leonard Findlay, and Mr. Warren R. Dawson.

Mr. J. Paterson Ross, M.S., F.R.C.S., read a short communication on the history of causalgia, that interesting neurological combination of burning pain, hyperaesthesia, wasting and vaso-motor disturbance which may follow wounds of the peripheral nerves. The condition was first described in the Transactions of the Royal Medical and Chirurgical Society in 1813 by Alexander Denmark, Surgeon to the Haslar Hospital, and again in 1832 by Antonio Scarpa, and by John Hamilton in 1838. Abernethy mentions the subject in the second volume of his Surgical Works, and that fine clinician, Sir James Paget, in 1864, spoke of glossy fingers following injury of nerves. In the same year appeared the important monograph on "Gunshot Wounds and other Injuries of Nerves" by Weir Mitchell, Morehouse and Keen. The term "causalgia" was used by Weir Mitchell in his book "Injuries of Nerves", 1872.

The Medical Society of the Royal Free Hospital, London, held a meeting on June 20th, Mrs. H. H. Chodak Gregory, M.D., in the Chair, Mr. W. R. Bett, Hon. Secretary, Historical Section, British Medical Association Centenary Meeting, gave an address entitled, "That other circulation: adventures and adventurers." The lecturer dealt briefly with the discovery of the lymphatics and lacteals, bringing into the story men like Herophilus, Erasistratus, Aselli, Pecquet, Eustachius, and others. Harvey, though far in advance of his time, failed to be thrilled by the secrets of the lymphatic circulation. He openly expressed his unbelief in the accuracy and importance of Aselli's discovery. An exhibition had been arranged of portraits and photographs, and a copy was on view of the first edition of Aselli's *De Lactibus*, published in Milan in 1627. The first anatomical work with coloured illustrations, it con-

tains four large sensational folding plates. In the later editions these are replaced by much smaller copper plates which are not coloured.

Alberta

During the first five months of this year the city of Calgary expended the sum of \$109,388 on municipal hospitals. The total hospital receipts during this period were \$62,525. In comparison, the expenditure for the first five months of 1931 was \$118,543 and the receipts \$66,220. The estimated expenditure during 1932 is \$277,455, for which an appropriation has been made. The estimated revenue for the year should amount to \$149,810. The estimated charge to the mil-rate is \$127,645. To the end of May the charge to the mil-rate had amounted to \$48,763 compared with \$52,326.66 during the same period of last year.

Reference was made in a recent issue of the *Journal* regarding the Commission which was appointed during the past session of the Legislature to consider possible methods of health insurance for the Province of Alberta, and to make recommendations at the next session as to the best method of making adequate medical and health services available to all the people, as well as the financial arrangements which would be required on an actuarial basis to ensure it. Of interest are the remarks made by Dr. H. W. McGill, M.C., M.L.A., of Calgary, referable to the question of health insurance. He stated that a similar commission had recently completed a study of the subject in British Columbia, where it had been recommended that a certain portion be deducted from all incomes above a minimum to be fixed, which would entitle residents of the province to treatment and care in the event of sickness. Many confuse Health Insurance with State Medicine, which is another broad subject, but the corollary to State Medicine under which the government would control and provide treatment would appear to be power for the state to dictate the manner of living. The essential difference between British Columbia and Alberta must be taken into consideration when the two are compared in regard to health insurance. The former province is largely one of employers and employees, whereas Alberta is a province of small proprietors. A great deal of study and consideration would have to be given to the entire question of health insurance. According to the Honourable George Hoadley, Provincial Minister of Health, information has been secured by the government from British Columbia, Manitoba and New York State. When sufficient material has been gathered from as many parts of the world as desired the committee will meet and the entire subject will be reviewed.

About one year ago, the Province of Alberta established two rural health units in an attempt to test out in sparsely settled areas what has been effective in other places where the population was more dense. The centres chosen for the experiment were High River and Red Deer. Each district has a similar staff of one physician, one follow-up nurse; one nurse-technician, one stenographer, one part-time sanitary engineer. The financial budget of each unit is \$10,000.00, of which the district is to pay one-quarter, or \$2,500.00, per year for three years; the provincial government pays one-half and the Rockefeller Foundation pays the other quarter. High River area has a population of over 14,000 and Red Deer over 18,000. The government has well chosen the first medical men for this experiment. These are Dr. W. G. Saunders for the High River district, and Dr. G. M. Little for the Red Deer district.

A statistical report of their year's work will be found most interesting and is as follows:—

<i>Work done</i>	<i>High River</i>	<i>Red Deer</i>
Public Health lectures given	45	37
Attendance at same	1,553	2,020
Pamphlets distributed	3,000	14,000
Newspaper articles published (seasonable)	54	13
Reports to Boards of Health	48	52
Private premises inspected	102	58
Public premises inspected	53	43
Creameries inspected	34	27
Dairies inspected	36	113
Hotels and restaurants inspected	89	111
Miscellaneous inspections	136	80
Visits to cases, suspects, etc.	138	169
Cases isolated	162	124
Contacts quarantined	18	34
Life Extension examinations	121	132
School children examined	2,382	3,623
Remedial defects noticed	1,779	2,857
Toxoid doses given	3,240	1,153

In the High River district pre-school examinations were made, as well as school examinations as fast as possible. Thus all schools were not examined the first year, but in the Red Deer district all school children were examined and all school children, where necessary, were vaccinated, but pre-school examinations were not planned or made the first year. In the High River district pre-school and pre-natal clinics have been held.

As the result of the report of the number of tonsillectomies performed indicated in the Red Deer district one rural councillor suggested that a surgeon should be placed on salary \$3,000.00 per year and expenses to care for tonsils, adenoids and defective teeth of those whose parents are unable to meet the cost for care. This was however voted down at the annual meeting of the Health Unit.

It has been suggested that were the Health Unit to place in their estimates what it would have cost as above \$3,600.00 and let the indigent cases go to the doctor of their choice, then let the doctors present their accounts and share in the money on the basis of the work done, even though the amount did not pay the bills in full this would be a much better and more satisfactory arrangement for all concerned.

The 1932 graduates of the University of Alberta showed up well at the examinations of the Medical Council of Canada. Twenty out of the 22 who wrote passed.

Recently a Commissioner of one of the cities of Alberta made the statement that the medical men of his city did on an average of \$750.00 worth of free medical service to the known indigent residents, and they made no provision for the payment of this work, though they did feed, clothe and shelter these same people at the city's expense. When it was suggested that some amount should be placed in the annual estimates, to cover out-of-pocket expenses at least, not much enthusiasm was manifested by the official.

G. E. LEARMONTH

British Columbia

The Pacific Northwest Medical Association met in Spokane, Ore., in the last week in June. Dr. B. D. Gillies, of Vancouver, B.C., was elected president for the ensuing year, and Vancouver was selected as the place of meeting for 1933.

At the annual meeting of the staff of St. Paul's Hospital in Vancouver, on June 15th, Dr. F. X. McPhillips was honoured on the occasion of his retirement from the active staff of the hospital. Dr. McPhillips came to Vancouver in 1893, and the following year saw the construction of St. Paul's Hospital begun. Since

then he has been actively employed on the staff of the institution.

Plans for the annual summer school of the Vancouver Medical Association are maturing. The school will be held September 13th to 16th, inclusive, and the teachers selected include Drs. W. E. Gallie and W. B. Hendry of Toronto; Dr. L. H. Clerf, of Jefferson; Dr. H. Helmholtz, of the Mayo Foundation; Drs. Geo. C. Hale and F. R. Miller of London, Ont.; and Drs. L. Eloesser and K. F. Meyer, of San Francisco.

Under the auspices of the Greater Vancouver Health League, a local branch of the Canadian Tuberculosis Association was recently organized. Interested bodies met at the Vancouver General Hospital and plans were laid for more extensive efforts in the direction of prevention, while fostering existing facilities for cure.

C. H. BASTIN

Manitoba

Dr. M. S. Fraser, Chief Health Inspector of the province, having reached the age of retirement, was retired from active service by Order-in-Council of the Manitoba Government on June 21st and placed on the superannuation list. He had served as Health Inspector for the past sixteen years.

Dr. Noel R. Rawson has been given a temporary appointment as Provincial Epidemiologist from June 1st. During the first part of this year he did post-graduate work at Toronto where he was awarded the diploma of Public Health.

At the recent provincial elections, held on June 16th, the medical candidates fared badly. In Winnipeg the Hon. Dr. E. W. Montgomery, Minister of Health, was defeated, and, in Springfield, Dr. M. McKay, leader of the Fusionist Liberals. Several other doctors went down to defeat. It is not yet decided whether a seat may be found for Hon. Dr. Montgomery who in the past five years has proved an able Minister in the portfolio of Health and Public Welfare. In the new House there will be only two doctors, Dr. Eiebe and Dr. E. J. Routledge.

A public dinner was held in the Royal Alexandra Hotel on June 7th at which Dr. H. M. Speechly presided. An address "Family Limitation—a Long View" was given by Prof. V. W. Jackson, Department of Biology, Manitoba Agricultural College, and the following resolution was passed unanimously: "Be it resolved that this meeting is heartily in favour of the public recognition of the social advantages of birth-control and advocates the establishment of clinics and other methods for the diffusion of scientific and reliable information in furtherance thereof."

Some two months ago a meeting was held of representatives of the Manitoba Medical Association and of the Union of Manitoba Municipalities to discuss the changes in the Municipal Act regarding municipal doctors. As a result, complete understanding was reached and changes were drafted in the Municipal Act which have recently been approved by the Manitoba Legislature. The Municipal Act as amended provides that a three-fifths majority of the electors is necessary to effect a change in the existing state of affairs, instead of a bare majority as formerly provided. Another provision is that where a vote on municipal doctors scheme is taken in a municipality which already has a resident physician, the electors shall have the opportunity of declaring on the ballot whether, in the event of a change to the municipal doctor system, the resident physician shall receive the appointment. A third provision is that no further vote on the municipal doctor scheme shall be taken until three years have elapsed. This provides for greater security of tenure. The fourth provision is that

all contracts shall be made on standard forms drawn up by the Department of Public Health, and that the contract shall be subject to approval of the Board of Health. The contract provides for two weeks' holiday in each year, with an additional two weeks every second year for purposes of post-graduate study. A municipal doctor is also to be allowed to attend the annual meetings of the Manitoba Medical Association and all the meetings of the local district medical association without deduction of pay on account of time spent at these meetings.

The Cardston (Manitoba) community is experimenting with something new in the way of medical treatment. It is a cooperative scheme between the two medical practitioners of the town and families of the community, whereby a charge of \$25 per annum per family will create a community fund from which the doctors will be paid. Over \$3,600 has already been collected, and further families are signing up. The scheme proposes regular medical examinations in an effort to "keep the community well."

ROSS MITCHELL

New Brunswick

Dr. G. A. B. Addy has tendered his resignation as Chief Surgeon to the Saint John Tuberculosis Hospital. Dr. George F. Skinner, former Junior Surgeon, was named Chief Surgeon, and Dr. O. B. Evans was appointed as Junior Surgeon.

Late in May an extra-mural team visited New Brunswick, speaking at Campbellton, St. Stephen, Saint John, Fredericton and Moncton. Dr. E. H. Mason spoke on "Advances in diagnosis and treatment of diabetes mellitus", and Dr. Gavin Miller, both of Montreal, discussed "Intestinal obstruction". The meetings were well attended and the discussions were instructive. Again, in the week of June 14th, Woodstock, Fredericton, Saint John, Moncton and Bathurst were visited by a second team. Dr. C. Ward, of Montreal, discussed "Post-menopausal bleeding", and Dr. P. N. MacDermot took as his subject "The problem of poliomyelitis". These speakers were greeted by much interested audiences and the presentation of their subjects was most happy. The subjects chosen were reviewed completely, and, although not much that was new was presented, this review is generally found to be well received by local audiences, as it takes the place of much reading. On the other hand, much of the material does not naturally fall into the hands of the physician who subscribes for only one or two journals.

The meeting of the New Brunswick Hospital Association was held in Saint John on June 27th. Addresses of welcome were read by Mayor Brittain and Hon. Dr. H. I. Taylor, Provincial Minister of Health. Dr. G. Harvey Agnew, Secretary of the Canadian Hospital Association, was present and conducted a round-table conference. Reports of local committees were received. Dr. S. R. D. Hewitt, Superintendent of the Saint John General Hospital, was elected President for the next year, and the meeting will be held in 1933 in Moncton. A special committee was elected to prepare a new Hospital Act. This committee includes George Gilbert, M. E. Agar and J. A. Reid. Dr. J. Arthur Melanson read a paper by invitation on "The work of the tuberculosis diagnostician in New Brunswick". Dr. G. Stewart Cameron, Peterborough, gave an address on the Nursing Survey Report.

The Maritime Catholic Hospital Association met in Saint John on June 28th and 29th. A large number of delegates were in attendance. Rev. Sister Mary Beatrice, of Antigonish, N.S., was elected President for 1933. Dr. G. G. Corbet addressed the convention on "The relations of the Workmen's Compensation Board to

hospitals". Many special committees reported, especially that on the subject of nurses' education.

The biennial meeting of the Canadian Nurses' Association was held in Saint John on June 21st to 23rd. One feature attracted chief interest in both the public, general and sectional sessions, namely the Survey Report on the nursing situation. Hon. Vincent Massey, P.C., LL.D., spoke on the "Public and the Survey Report." Prof. Roy Fraser, Mount Allison University, addressed another special session on the subject "The scientist and the Survey Report." Dr. Stewart Cameron of Peterborough, Chairman of the joint Study Committee, introduced a general discussion of the report at a meeting of the Nursing Education Section. The various sections and applications of this report were discussed by members of the nursing profession. A large amount of publicity was provided by the press association. Various resolutions contained in Professor Weir's Survey were passed for consideration by the National and Provincial Joint Study Committees. A resolution of appreciation was forwarded to Professor Weir by the convention.

A resolution of interest was the desire expressed to open negotiations with the General Council of Public Health in England and Wales for the purpose of establishing reciprocity with Canada in the matter of registration of trained nurses.

Another resolution was addressed to the Minister of Pensions and Public Health, with the request that a representative from the Canadian Nurses Association be appointed to the Dominion Council of Health.

It was resolved that all accredited schools should set junior matriculation, high school graduation or graduation from a special nursing high school course as the entrance requirements.

The registration at this biennial convention was considered large in the face of the present hard times. All of the delegates were loud in their praise of the hospitality provided by the Saint John and New Brunswick Nursing Associations for which hospitality expressions of gratitude were voiced in resolutions directed to the Executives of the local associations.

A. STANLEY KIRKLAND

Nova Scotia

The Medical Society of Nova Scotia held its 79th annual meeting at Kentville from July 4th to 6th. The Society has met every year since its formation in 1853. The program was varied and interesting. The report of the advisory committee to the Public Health Department as to what the profession endorses in health legislation was put before the meeting and there was a discussion of the publication of a history of the Nova Scotia Medical Society, and the extension of medical and public health nursing services to rural districts not able financially to arrange these for themselves. Distinguished guests at the meeting were Professors Rudolf and Ross of Toronto, Dr. Frank Lahey, Boston; Dr. Britton, Moncton, Dr. Haggart, of Boston, and Dr. Tidmarsh, of Charlotte-town. Dr. A. F. Miller, of the Kentville Sanatorium, conducted a three day "refresher course" in tuberculosis during the week.

Nova Scotia mourns the passing of two well-known practitioners of medicine, Dr. W. MacK. MacLeod, of Sydney, died on Sunday, June 12th at the age of 77. He had practised medicine for over fifty years, took an active interest in politics, and at one time was a member of parliament. Dr. Finlay MacMillan, of Sheet Harbour, the oldest graduate of Dalhousie University Medical School, died on June 21st, in his 89th year. He was a prominent figure in medical circles. In 1928 Dalhousie University conferred upon him the degree of Doctor of Medicine, *Honoris Causa*.

Dr. Charles S. Morton has been appointed by the Nova Scotia Government a member of the Provincial Medical Board.

Dr. E. P. Glenister has been elected a Senator of St. Mary's College.

Dr. A. M. Marshall has left for England to attend the centenary meeting of the British Medical Association. He proposes to stay in Europe for a two years' post-graduate course in medicine. N. B. DREYER

Ontario

The many friends of Dr. J. T. Fotheringham, of Toronto, are pleased to note that he was elected a Life Member of the Canadian Medical Association at the recent annual meeting.

Through the kindness of Dr. John Ferguson, of Toronto, the Ontario Medical Association has been presented with a gavel made from oak from the British war vessel, *The Hunter*, which went down in Lake Ontario in an engagement with American ships during the War of 1812. In acknowledging this gift at the annual meeting of the Association, the Secretary stated that Dr. Ferguson had not missed a meeting of the Association in fifty-one years.

The College of Physicians and Surgeons of Ontario has recently issued the Medical Act as amended by the Legislature in 1932. This is available for all practitioners. The last meeting of the retiring Council of the College was held in June and the new Council will be elected under the new Act, with ten territorial members, one member for each active medical school or faculty, one representative of the homoeopaths and the Minister of Health for Ontario, *ex-officio*.

Announcement has recently been made that the Board of Trustees of the Toronto Orthopaedic Hospital has amalgamated the assets of that hospital with those of the Board of Governors of the Toronto East General Hospital. This amalgamation takes place immediately and the orthopaedic services of the Toronto Orthopaedic Hospital are being transferred to the Toronto East General Hospital. The fifth floor of the Toronto East General Hospital will be used for orthopaedic work and the nurses in training of the Toronto Orthopaedic Hospital will be taken care of in the new \$100,000 nurses' home, which is now ready for occupation. In due course, there will probably be built a six-storey convalescent and orthopaedic wing. Arrangements have been made to fill the three present vacancies of the Toronto East General Hospital Board of Governors with three members of the Board of Trustees of the Toronto Orthopaedic Hospital, who have been asked to take a special interest in the conduct of the orthopaedic department. This amalgamation has received the unanimous approval of the Boards of the respective institutions.

About 65 women doctors attended the annual meeting of the Federation of Medical Women of Canada which took the form of a banquet during the course of the annual meeting of the Canadian and Ontario Medical Associations in Toronto. Dr. Gladys Boyd presided over the function.

Hon. Dr. John L. Chabot, of Ottawa, was elected President of the Council of the Ontario College of Physicians and Surgeons on June 29th. He is the first French-Canadian to hold that office. A well-known surgeon of the capital city, Dr. Chabot had the distinction of defeating Sir Wilfred Laurier, the then Liberal leader in the Dominion election of 1917.

Dr. Edgar H. Frankish, a well-known Toronto physician and surgeon, expert in autopsies and ballistics, has been appointed by the province to do research work where crime is suspected in regard to deaths.

His many friends in Canada, particularly in Toronto, will be interested in learning that Prof. H. E. Roaf (Univ. of Toronto, 1902), has resigned the Chair of Physiology at the London Hospital Medical School on his appointment to the Chair of Physiology in the University of Liverpool. J. H. ELLIOTT

Quebec

The figure for infant mortality during the month of April is the lowest ever recorded in the Province of Quebec, being 12.5 for the general mortality, and 96.2 for the infantile mortality alone.

The figures relative to vital statistics have been reduced in all directions. The number of births during the month was 6,550; of marriages, 1,030; deaths of persons at all ages, 3,002; and deaths of infants under one year, 630. In 1929, a record year, there were 1,676 marriages in April; in 1931 1,030.

In the compilation of these statistics Montreal naturally plays the chief rôle. With a population of 1,048,197, during the month of April 499 marriages were celebrated; there were 1,637 births; and the deaths numbered 1,183. During this month, also 212 infants, under the age of one year, died.

Dr. Joseph Louis Petitclerc, for five years Assistant Professor of Clinical Surgery at the University of Alberta, has recently been appointed chief of the Surgical Service of the Hôtel-Dieu du Précieux-Sang at Quebec. He divides the service with Dr. C. Vezina. Dr. Petitclerc is not unknown in Quebec. He was intern at the Hôtel-Dieu in 1910. He then spent two years at Paris in post-graduate study. He served in Europe during the Great War. In 1920 he left Quebec for Edmonton, where he made good in his profession and gained the confidence of his compatriots.

Saskatchewan

A special clinical meeting of the staff of the Regina General Hospital was held on "Cancer." Dr. R. C. Riley spoke on "Cancer of the breast"; Dr. F. L. Burrows and Dr. J. A. Brown spoke on "The use of x-ray and radium in cancer." Dr. F. A. Corbett gave the surgical report of the Cancer Clinic in Regina and Dr. C. M. Henry gave the radiological report.

Doctor Henry again reviewed the routine of the clinic. The patient is presented at the clinic by the family doctor, or if the patient comes from a distance the attending physician refers him to a local physician. If no selection is made by the attending physician the secretary of the clinic chooses the next physician on her list of local men on her file. The referring physician, or the local physician, is requested to be present to confer with the clinic group when examination of the patient is made, to assist the clinic in making a diagnosis and to help plan the treatment best suited for each individual case. The patient remains under the care of his own physician during treatment, whether it be surgical, radium or deep x-ray therapy. When special treatment is advised the physician should assist or be present. When all the treatments are concluded the referring physician is so advised, and the patient is instructed by the secretary when to return for re-examination or further treatment. The referring physician is informed when the patient is to return. The physician should be present when the follow-up examination is made.

During the first five months of the Cancer Clinic 107 patients were examined, of whom 81 had some form

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	Number of Cases	
	Treated	Improved
I. Amenorrhœa:		
1. Primary	8	1
2. Secondary:		
(a) Oligomenorrhœa	20	18
(b) Oligomenorrhœa (with lapses)	14	12
(c) Regular (with lapses)	19	11
II. Polymenorrhœa	8	7
III. Dysmenorrhœa	36	26
IV. Menopausal Symptoms	18	14

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of malignant disease. There were 7 rodent ulcer and senile keratitis cases. Three of these cases were given superficial x-ray only; one in which there was ulceration and induration received x-ray and surgical coagulation. The others received applications of radium given by a radium pack at a distance of $1\frac{1}{2}$ cm. All of the cases have responded to treatment, but two required additional radiation before the lesion was healed.

One case of Hodgkin's disease responded to moderate x-ray treatment, with the disappearance of all palpable lymphatic glands and a general improvement in health; this case received three series of radiations.

There were 19 cases of epithelioma of skin and mucous membranes, 7 of the lip, 6 of the tongue; 2 of the oesophagus; 1 of the larynx; and 2 of the cervix uteri. The simple, non-indurating, recent squamous epitheliomata with no evidence of gland enlargement received superficial x-ray to the affected area, and moderately deep x-ray to the glands of both right and left sides of the neck. Two patients reported the lesions healed, with no evidence of metastases. When the disease was of the ulcerative, infiltrating type, rapidly growing, with or without gland enlargement, radon or radium needles were inserted interstitially or a radium needle pack was applied at a 1.5 cm. distance. After the radium treatment; the patient returned in one month and a complete block dissection of the affected side of the neck was performed; this was followed either by deep x-ray or by a radium pack. Four cases have reported with healed lesions.

Of the 6 cases of epithelioma of the tongue, 4 received treatment; 1 refused; 1 was too far advanced. The treated patients had interstitial implantations of radon; one had both radon implants and radium needles. All have had or will have a block dissection of the cervical glands, and either deep x-ray or radium pack applied after the block dissection.

There were 2 cases of epithelioma of the penis. The clinic has followed the technique of Mr. Cade, of London. One case where a supra-pubic cystostomy was performed was a poor surgical risk which resulted fatally. In the second case a catheter was used to drain the bladder; radium needles were inserted into the glans penis, and a radium pack was applied over the inguinal gland region, long enough to produce an erythema of the skin; then deep x-ray therapy was given two months after the radium treatment, because the inguinal glands were palpable. The penile lesion is practically healed. The cases of epithelioma of hard and soft palate, tonsils and posterior pharynx received a combination of radium, radon implants and radium packs. These showed temporary benefit only. The prognosis is bad. The pharyngeal case died.

There were 39 cases of carcinoma, as follows: breast 14, uterus and cervix 15, stomach 5, oesophagus 2, pharynx 1, mediastinum 1, abdomen 1.

The breast cases are classified clinically as follows: (1) Those of definite low-grade malignancy, slowly growing, with no palpable glands. These, 6 in number, received deep x-ray after complete surgical removal of breast and lymphatic area. X-ray treatments were repeated at monthly intervals for three series. These cases reported a healed breast, no evidence of gland enlargement, and general health improvement. (2) Those patients having a fast growing, adherent, breast tumour in young women of the child-bearing period, with palpable gland metastases. There were 3 cases in this group. After surgery, these received radium packs, both on the front and back of the chest, varying from 20,000 to 28,000 mgrm. hours, sufficient to produce a mild erythema. The pack or deep x-ray was repeated in two months. (3) The inoperable case, with an adherent fixed tumour, possibly ulcerating, with metastatic glands all along the lymphatic chain, and likely chest infection. This condition is often of long standing in elderly people. Three cases were treated by radium needles placed interstitially in and around the tumour, along the lymphatic

drainage, to and in the axilla, below and above the clavicle, and between the ribs close to the sternal margin. About 70 to 90 mgrm. were introduced and left *in situ* for nine days. Six weeks following the removal of the needles a radium pack was applied, so that the patient had a total dose of over 30,000 mgrm. hours. The temporary results have been gratifying. The lesions have become smaller, glands have disappeared, the breasts have become movable, and the physical and mental condition has wonderfully improved. Even if a cure is not possible, the patient is relieved of the distressing, fungating, foul, sloughing ulceration; the mental outlook is changed to hope, and bodily comfort has been obtained.

There were 15 cases of carcinoma of the uterus and cervix, divided into 4 groups: (1) infection of the cervix only, 8 cases; (2) infection of the cervix and mucous membrane surrounding the cervix, 2 cases; (3) cervix, vaginal wall and broad ligament involvement, with or without uterine fixation, 5 cases; (4) fixed uterus and adnexa, involvement of cervix and vaginal wall, 3 cases. All cases received radium treatment, not only against the cervix but in the right and left vagin. fornix, cervical canal, and uterine cavity. This was followed by deep x-ray to the pelvis. Radium dosage varied from 5,000 to 10,000 mgrm hours. Two patients had a pan-hysterectomy, one surgical diathermy. Three of the first class show a normal appearing, smooth, soft cervix, with no symptoms; general health good. One of the second class has extension into the base of the bladder but the vaginal area is normal. One had a total hysterectomy with involvement at the internal os and neck of the uterus; here healing is not complete, as there is some evidence of growth. The third and fourth class show general physical improvement, lessened vaginal discharge, and no bleeding, but the prognosis is bad. Over half of the malignant cases seen in this clinic belong in the first group which speaks well for the perception of the physicians of southern Saskatchewan.

There were 7 cases of sarcoma as follows: parotid, cervical glands, prostate, kidney and tibia. The kidney case died six weeks after treatment from general abdominal metastases; the other cases are living and show improvement.

The other cases include Hodgkin's disease, 2; pigmented mole, 1; pituitary tumour, 1. The pituitary case died from general cranial involvement.

LILLIAN A. CHASE

United States

Harvard University.—Dr. Harvey Cushing will retire September 1 as Moseley Professor of Surgery at Harvard University Medical School, a position he has held since 1911. At the same time, he will retire as surgeon-in-chief of Peter Bent Brigham Hospital. Dr. Cushing received the degree of doctor of medicine from Harvard in 1895. From 1902 until he was appointed at Harvard he was associate professor of surgery at Johns Hopkins University School of Medicine. During his career he has been the recipient of many honorary degrees from medical institutions throughout the world. In 1922, he was awarded the Charles C. Mickle Fellowship of \$1,000 by the University of Toronto Faculty of Medicine. This prize is given to the member of the profession anywhere in the world considered by the faculty to have done most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science. In 1923, Dr. Cushing was awarded the Distinguished Service Medal. He received the Lister Medal of the Royal College of Surgeons in 1929. In 1923, he was President of the American College of Surgeons and the American Neurological Association, and in 1926 of the American Surgical Association. He is the author of many volumes. His book on "The Life of Sir William Osler" won the Pulitzer Prize in 1925.

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CANADA

At the time of the report of his resignation, Dr. Cushing's future plans were not definite.

Dr. Elliott Carr Cutler, since 1924 director in surgery at the Cleveland Lakeside Hospital, and professor of surgery, Western Reserve University School of Medicine, has been appointed to succeed Dr. Cushing as professor in the medical school and as surgeon-in-chief at the hospital, effective September 1st. Dr. Cutler is also a graduate of Harvard University Medical School.

Johns Hopkins University.—Dr. Henry E. Sigerist, director of the Institute of the History of Medicine at the University of Leipzig, has been appointed to succeed Dr. William H. Welch as the director of the Johns Hopkins Institute of the History of Medicine. Dr. Sigerist was a pupil of Karl Sudhoff, whom he succeeded in his present post at the University of Leipzig.

Dr. Sigerist was a philologist specializing in Oriental languages before turning to medicine. He has studied in the Universities of Zürich, London, Leipzig and Munich and has written numerous monographs on medical history and translations of ancient medical texts. His recently completed book, "Man and Medicine," will soon be followed by a medical history in biographical form, "Great Physicians."

General

American Gynecological Society.—The meeting of the Fellows of the American Gynecological Society took place this year in "Old Quebec." Socially, the meeting was generally spoken of as a great success owing to the "atmosphere" of the historic setting. Scientifically, the meeting was perhaps not of so high an order as is the rule for this gathering of the foremost in this and the country to the south. In the first place, the program was inexcusably long for the time at the Society's disposal. The consequences were inadequate time for discussion and the permitting of inaccurate observations to pass unchallenged, and, therefore, much that could not stand scientific scrutiny was allowed to obtain the sanction of the Society. Much more good would be accomplished by this exclusive Society, if their deliberations were longer and their subjects fewer. Personally, the writer felt so fatigued by the three days of session that recuperation after the meeting was essential, and he is not alone in this opinion. Papers follow one another in such rapid order that items of interest make but a faint impression. However, there are always brilliant theses deserving of prolonged study.

The president's address is always a *pièce de résistance*. Dr. Gellhorn's dealt with "Diatheses." This subject, as old as medicine, has received a new impetus in recent years from the German schools, and President Gellhorn gave a clear and exact division of the unit into its compound medical types. It is a subject of broad interest, worthy of our closest attention.

Professor Zondek's paper upon his work concerning the action of the anterior pituitary in its relation to the pelvic organs was a masterpiece of clear thinking in the correlation of the ductless glands. Too little time, in fact, no time at all, was given to the discussion of this most interesting pioneer work.

Sampson's paper upon endometriosis of the Fallopian tube, and Novak's correlative work, were the only papers that were discussed at any great length. They deserved much more attention. Fluhmar's paper on the "Reticulo-endothelial cell, elicited by a hormone injection," was stimulating, but incomplete. Karl Wilson's advocacy of the hyperthermia treatment of gonorrhea in the female is drastic, though seemingly effective, but will never be popular.

The endeavour to determine the cause of occipito-posterior presentation in the anthropoid outline of the superior pelvic strait is a step forward in our appreciation of this difficult subject.

J. R. GOODALL

International Cooperation in the Hospital Field.

The International Hospital Association, organized last summer, has already manifested a very satisfactory development, notwithstanding the world-wide economic depression. Up to the present, 15 national hospital associations have joined it. Five of the 11 study committees organized have brought their preliminary work to such a point that it has been possible to print their programme of work in the second number of the 3rd year of *Nosokomeion* which has just been published. This quarterly is the official organ of the Association and is edited in Stuttgart by W. Kohlhammer. The study committees' programs indicate the great number of questions connected with modern hospital services and constitute a collection of material which has been scientifically and systematically brought together; it will render valuable service in all professional fields and to all leaders who are developing hospitals into health centres for towns and districts. It lies with the responsible persons to use and adapt this material to the characteristics of hospital services in the different countries.

The International Congress on Biliary Disease meets at Vichy, France, September 19 to 22, 1932.

Participation in all the educational and social features of the Congress is secured by registration and the payment of a fee of 50 francs (French). Reduced rates for travel and hotel residence have been secured.

The official program of the Congress and information respecting steamship rates, hotel accommodations, etc., may be secured by addressing Frank Smithies, M.D., President of the Congress for the United States, 920 N. Michigan Avenue, Chicago, Ill.

Canadian Tuberculosis Association Prize.—A prize of one hundred dollars has been awarded by the Canadian Tuberculosis Association to Dr. John Cruise of the staff of the Manitoba Sanatorium, Ninette, for a study of "Erythema nodosum in undergraduate nurses and its relationship to tuberculosis."

Book Reviews

Modern Medical Treatment. E. Bellingham Smith, M.D., F.R.C.P. (Lond.), Physician and Lecturer on Medicine, St. George's Hospital and Anthony Feiling, M.D., F.R.C.P. (Lond.), Physician, Lecturer on Medicine, and Dean of the Medical School St. George's Hospital, London. 2 volumes, demy 8 vo., 1432 pages. Price \$11.00. Cassel & Co., London; McAinsh & Co., Toronto, 1931.

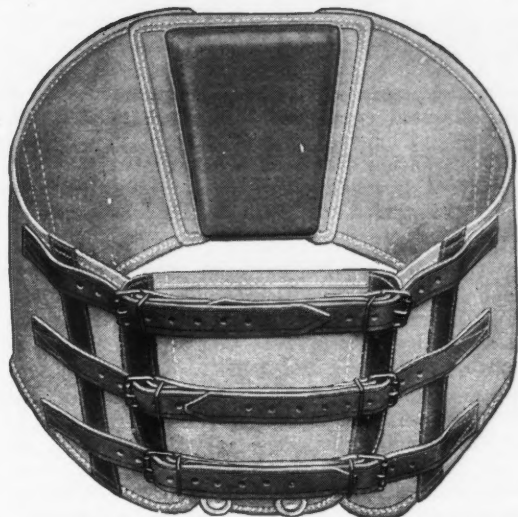
In the "author's preface" the writers of these two volumes have given a very justifiable apologia for their contribution to the literature of therapeutics. Sir Humphry Rolleston in his introduction refers to the volumes as "attractive". The term is well chosen.

The outstanding features of the work include several qualities that give it a place of distinction and make it a very desirable acquisition to the practitioner's library. For example, perhaps the most appealing feature is the concise preamble in each subject giving the essential clinical characteristics of the disorder treated. Another attractive feature is the pervading consciousness of the relationship between the medical and surgical aspects of treatment. An effort is made, and fairly successfully, to give guiding principles for the recognition of surgical indications. Yet there is due caution in the matter of selecting surgical procedure where untoward risks are incurred. An unusual, but very advantageous feature of the publication is the devotion of four chapters to infant feeding and the alimentary disorders of infancy and childhood. In consequence the volumes have a more

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comprehensive value for the practitioner's reference than most texts of therapeutics.

One cannot but remark the order in which the different diseased systems are handled. It is rather a striking innovation to see a work of this nature headed by the disorders of the nervous system and ended by the infections. This might be facetiously expressed as the "reverse English". From the point of view of the frequency of human disorders in relation to the different systems, it is quite likely that volume two will be more frequently thumbed than volume one by the majority of readers.

Of the more recent clinical entities to engage widespread recognition, coronary thrombosis has been given hardly the detailed attention that is its due. While the principles enunciated are sound enough, the treatment is not given that more precise elaboration that helps the reader to know the best way to approach this dread disorder.

The practitioner will do well to add these two excellent volumes to his library.

A Textbook of Surgical Pathology. Charles F. W. Illingworth, M.D., F.R.C.S. (Ed.) and Bruce M. Dick, M.B., F.R.C.S. (Ed.). VIII and 677 pages, 290 illustrations. Price 36s. J. & A. Churchill, London, 1932.

This is a good book. It is unconventional. We miss the familiar chapters on inflammation, suppuration, and ulcer, and the consideration of burns, while excellent, is rather exiguous. However, the book was written for graduates and senior students, and the authors, therefore, presume a certain amount of general knowledge of pathology on the part of their readers. Thus, a certain amount of valuable space is gained for the fuller discussion of more immediately important subjects. This is a wise idea. The classification of tumours will not satisfy the pure pathologist or systematist. Indeed it is hard to find one that will, and the authors are not ignorant of the matter. Still, one is tempted to conclude that, after all, for the purposes of the surgeon, the simple old classification of tumours into benign and malignant—solid and cystic—is good enough!

After introductory chapters on Shock, Burns, Tuberculosis, Actinomycosis, Aerogenic Infection, Echinococcus Disease, and Tumours, the book proceeds on a regional basis and is hereafter rigidly systematic. The discussion of the various lesions of surgical import is well balanced, and the authors everywhere show a familiarity with the applied anatomy and physiology of the various regions considered, and with the lesions of the operating room and the pathological and research laboratories. Many of the difficult points on which we desire to get enlightenment are dealt with judiciously and helpfully, such as the relationship of so-called "chronic mastitis" to cancer; the relationship of prostatitis and prostatic hypertrophy to cancer; the forms of goitre, and many others. The illustrations are from the collections of the University of Edinburgh and the Royal College of Surgeons of Edinburgh and are always illustrative.

This work can be recommended without hesitation.

Recent Work on Ptosis (Prolapse) of the Female Pelvic Viscera. E. Hesketh Roberts, F.R.C.S., M.B., B.S., Gynaecological Surgeon, St. John's Hospital, Lewisham, London. 118 pages, illustrated. Price 9/6 net—11/6 foreign. Dickson & Scudamore, London, 1931.

This work deals with a live subject which should awaken interest in every gynaecological surgeon, but the text is very involved and does not lend itself to easy reading. The methods advocated for the dissection of the pelvic fascia and its easy exposure are the best part of the book. When the author comes to the clinical application of the anatomical knowledge there is a looseness of terms that will tend only to confuse those

who have not a profound knowledge of the clinical pathology of the pelvic organs. It is quite evident that the author lacks that same knowledge. There is a difference, it may seem needless to point out, between endocervicitis and cervicitis, and between endometritis and metritis, and hormones have a clinical value that must not be adduced to explain all (to some) obscure syndromes and associated lesions. Amputations of the cervix for diseased enlargement is now almost a thing of the past, and carries with it a very great danger, in spite of the author's opinion to the contrary.

Appendix I is made up of x-ray plates which add nothing to the text and, in most instances, are not decipherable.

Pain in the Pleura, Pericardium and Peritoneum.

Joseph A. Capps, M.D., Professor of Clinical Medicine, University of Chicago. 99 pages, illustrated. Price \$3.00. Macmillan Co., New York and Toronto, 1932.

A concise account of the various types of pain produced by disease or injury of the pleura and pericardium. The anatomical descriptions are clear and the explanations given of the pathways by which pain is elicited in regions remote from the cause are easily followed. The book is to be recommended to both student and practitioner.

Quantitative Clinical Chemistry, vol. II, Methods.

J. P. Peters, M.D., Professor of Internal Medicine, Yale University, and D. D. Van Slyke, Ph.D., Sc.D., Member of the Rockefeller Institute for Medical Research. 957 pages, illustrated. Price \$10.00. Williams & Wilkins, Baltimore, 1932.

The first volume of this book, which dealt with the clinical interpretation and significance of laboratory findings, received a warm welcome in these columns and elsewhere on its appearance last year, as by far the most complete and authoritative of the now numerous works on the same subject. The second volume is worthy of its precursor. Naturally, since it deals solely with the methods by which various analyses should be performed, it will not make much appeal to those who do not actually carry out biochemical work; to most of those who do, it will be invaluable. Biochemists have long been awaiting a book which would not merely reproduce the directions of the devisors of each method quoted, but should criticize and collect the criticisms of others. This book is the nearest approach to such an ideal that has yet appeared. The merits, the disadvantages, and the limitations of the various processes are duly weighed; the exposition is lucid and sufficiently detailed; the methods are well selected and up-to-date. It is to be hoped that this book may do something to stir those who through mental inertia cling to discredited and inaccurate analytical methods, when better ones, often no more elaborate, exist and are well recognized. A long chapter in the book is devoted to the various applications of Dr. Van Slyke's manometric gas-analysis apparatus; the other sections describe methods more familiar in type for the analysis of blood, faeces, urine and alveolar air. An appendix is devoted to special topics, such as dye tests and the van den Bergh reaction. Not the least valuable part of the book is the introductory discussion of general technique. As in the first volume there are generous bibliographies and complete indices. The misprints and inaccuracies which slightly marred the previous work have been eliminated for the most part in the present volume.

BOOK RECEIVED

A Guide to Anatomy. E. D. Ewart, Certificated Teacher and Examiner, Chartered Society of Massage and Medical Gymnastics. Third edition. 338 pages, illustrated. Price 12/6 net. H. K. Lewis, London, 1932.